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Alberta Naturalist

VOL. 12 NO. 2

JUNE 1982



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ALBERTA NATURALIST

VOLUME 12 NUMBER 2

JUNE 1982

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COVER: "Gorilla", by Peter Karsten

WHAT CAN A ZOO DO?

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Environmental and wildlife statistics for the future are depressing. Over a thousand species of significant animals in higher classes are threatened with extinction by the year 2000. As we know, it is the loss of habitat which ultimately will eliminate wild species of fauna and flora alike, and not actually the harvest of these life forms, which can be regulated. Man's population is estimated to reach 7 billion by the year 2000. Populations will double within 25-35 years in Third World Countries, and much of the tropical rain forest there will be eliminated to make room for cultivated crops. The now diverse habitats supporting thousands of unique species will be homogenized, offering existence to only a few which can cope in the man-made environment.

Zoos are often described as modern arks. Perhaps that is so, but how many species can be perpetuated in zoological gardens, aquariums and game parks? According to the 1978 International Zoo Yearbook, only 578 mammals species have been bred in captivity and of these, 345 species had multiple generation births. It is only the latter number which offers hope. The proportioned success with bird species is even lower than the 8.4 per cent of the 4,100 mammal species. 130 of the mammalian species bred in captivity are listed as endangered, which reflects the efforts made to concentrate on this category. The inadequacy of space and funds will limit opportunities to maintain that ratio in the future. There are approximately 800 zoos in the world - their entire space is equivalent to 200 square miles while the world land area is over 57 million square miles. A hopeless prospect.

How many people have seen a gorilla in the wild? I have talked to only six or eight people who have had this experience, yet I meet literally thousands of animal people through my participation in national and international zoo and wildlife associations. It is also known that 120 million visitors come to zoos in North America annually. The attendance figure for Canada alone is estimated at 15 million. The number for the world's zoos combined could well be over 300 million visits. There are a little over 250 gorillas in captivity; if only 1/3 of the zoo goes visited these gorilla exhibits, we can assume that 100 million people somehow see a living gorilla each year. A "Save the Gorilla" project would be quite responseless without these contacts.

To illustrate another example, namely the controversial killer whale issue, it can be said that the killer whales exhibited to the public do not represent a gene pool or a breeding population with the opportunity of propagation in captivity, should we foul up their natural living space. I submit that these few whales do more for the survival of their species in a public aquarium or oceanarium than an army of profound nature interpreters, teachers and naturalists such as you and I. The living animal is the most powerful catalyst in generating wildlife appreciation, especially in the novice or indifferent bystander. The combination of naturalists and zoo animals offers an unparalleled opportunity to modify society's value systems and plant the seeds which grow into nature awareness and appreciation. A zoo is a re-

warding and conducive environment which offers recreational experiences, easy accessibility, comfortable park benches, hot buttered popcorn, a playground for children, a place to sport a new set of summer fashions, and thousands of flowers to enjoy - all this without mentioning the privilege of seeing wild animals. The Calgary Zoo has 3/4 million visitors annually, a number greater than the City's population. It would be too optimistic to think that all these visitors come with an understanding of worldwide conservation concepts, the knowledge that many of the species they see will never be seen alive by future generations, or for the simple pleasure of marvelling at the diversity, beauty and ingenious adaptation of wild creatures. The repeat visits, however, may be a beginning.

Looking back in history gives us a good reference point as to why zoos came into existence in the first place. The keeping of wild creatures is as old as the dawn of man. The fascination with wildlife gave rise to valuing animals as prized possessions. Later, domestication of a variety of animals offered an economical base by turning them into food reserves and helpers for hunting, work and battle. Animals were worshiped and were also objects of sacrifice in many societies. The rulers of early civilizations and countries often expressed their wealth through the number of wild, and especially exotic, animals in their collections. Enormous menageries existed in China, Egypt, Assyria and later in Greece and Rome. Caesar had more than 3,500 animals - a collection only surpassed in number on this continent by the San Diego Zoo. Montezuma's Zoo required 600 zoo keepers.

By the end of the 18th Century, private zoos had gradually become public places. Parliamentary forms of government replaced monarchies and the general populace influenced zoos greatly in their mode of operation and appearance. Zoos, however, remained as menageries, and the "stamp collection syndrome" prevailed up until almost the middle of our century. Prestige and size of a zoo was measured by the number of species exhibited. Much attention was paid to rare animals and the fact that the zoo was perhaps the only one in the country (or even in the world) which exhibited such a species. We are quick to point out that this was wrong and not conservation-oriented. Zoo men of the past were no doubt more fortunate in respect to the abundance of wildlife available, the absence of complex import/export permit requirements, and the greater ease in finding space to build a zoological garden. Then, as today, the complexity of developing and maintaining a zoo centres around the economics of such a venture, as well as the mere fact that man's tools are, for the most part, inadequate to "manage" nature.

In the matter of economics, few zoological gardens are self-supporting. They generally receive public funds over and above revenue. Zoos are expensive to operate, but traditionally offer the public inexpensive visits. The admission fees generally recover only a portion of the annual budget. Just to break even for maintenance and the building of new exhibits, all visitors (regardless of age group) would have to pay \$10 each. The Calgary Zoo has the support of a very active Society which has solicited substantial donations from the community, private organizations and individual donors.

I decided to work for a zoo almost 18 years ago, which is when I became an employee of the Calgary Zoo, Botanical Gardens and Prehistoric Park. Eighteen years is a relatively short period of time but, since then, the changes in philosophy, technology, sophistication of animal exhibition and, more so, the fundamental purpose of zoos, have been dramatic. Conventional zoo cages built with the proverbial bricks and bars of jails are, of course, outdated design concepts. Today, zoo men strive to create animal homes which are a duplicate of the animal's home in the wild - a goal that is ambitious and understood to be a compromise at the best of times. Habitat display comes in the product of the expanded information available about

natural behaviour of animals in the wild, modern exotic animal husbandry techniques, research into captive behaviour, the desire to provide much broader education and the need to create wildlife appreciation by presenting animals in an appropriate and aesthetic setting.

Today zoos are wildlife producers, rather than wildlife users. A recent study by the American Association of Zoological Parks and Aquariums shows that less than 2 per cent of the animals displayed were collected from the wild. There is, however, a considerable number of animals coming into zoos from the wild through rescue and orphanage programs. The Calgary Zoo receives over 800 specimens in a year. Many injured specimens are rehabilitated and displayed, many are traded to other zoos worldwide in exchange for wildlife of their region that have been obtained in the same fashion, and others are reintroduced into the wild. Rescued musk-ox calves and polar bear cubs have been flown from the Northwest Territories to be reared in the Calgary Zoo. The Calgary Zoo's resident collection of animals number 1,200, fluctuating throughout the year. Recent efforts provide more focus on the plant collection in an attempt to create an "eco-zone". This will give opportunities to interpret total ecological concepts and the interrelation of fauna and flora in nature. Recently, a series of habitat displays have been built at the Calgary Zoo. Among these are exhibits for Siberian tigers, snow monkeys, snow leopards, Australian animals, nocturnal animals, grizzly bears, wolves, eagles, moose and reptiles; others are under construction and in planning.

In the future, I see zoological gardens intensively engaged in propagation programs, with additional land being secured for the core zoos to operate breeding programs on ranches outside the urban space. New programs have already been added to the international studbook programs, for example, the Species Survival Plan. This program commits participating zoos to combine all individuals of the target species for a consistent gene pool management program to protect and improve the genetic quality of the herd or group.

Zoological facilities can be catalysts and ambassadors of the conservation message and help form an environmental ethics to place conservation of nature high on our priority list. Zoos will work hand in hand with conservation groups to combine their resources and achieve the ultimate goal - optimal protection of our natural environment.

OVERHEARD. . .

"You cannot begin to preserve any species of animal unless you preserve the habitat in which it dwells. Disturb or destroy that habitat and you will exterminate the species as surely as if you had shot it. So conservation means that you have to preserve forests and grassland, river and lake, even the sea itself. This is not only vital for the preservation of animal life generally, but for the future existence of man himself - a point that seems to escape many people."

*Submitted by Murray A. Tozer, from
"Two in the Bush" by Gerald Durrell*

Last December-January we invited the authors of the following articles to submit tentative "blue lists" of species for publication in the "Endangered/Threatened Species" issue of the Alberta Naturalist. Rather than set up constraining or limiting sets of criteria, terms of reference and format were left up to each author. It was our feeling it was important to get something down on paper, in tentative form, to serve as a possible jumping-off point for further inquiry into the status of certain species in Alberta. The tentative nature of these lists must be stressed. We also invited the authors to comment on their lists, listing in general, and any other reservations they may have. Where separate, their comments appear in brackets at the beginning of each article. - Editor

ENDANGERED SPECIES/HABITATS - BUTTERFLIES

by C.D. Bird
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One hundred years ago, the major factors affecting the abundance and distribution of Alberta butterflies were weather, fire, parasites, and predators. Population control resulted from pressures directed mainly at the food plant, the insect itself, or both.

The butterfly fauna of non-agricultural areas in Alberta remains much as it was prior to settlement. Areas of concern are fire control, resource exploration and extraction, and road construction. Fire is a natural ecological event: its major role being that of ensuring the presence of successional plants and their associated faunal communities. Logging for pulp, lumber, and posts; strip mining for coal; and sulphur dioxide emissions from natural gas plants all affect natural communities. Road construction opens up unique areas to development and allows a route for the spread of weedy species. The Cabbage White (*Pieris rapae*) and Alfalfa Butterfly (*Colias philodice eriphyle*) now occur over much of the province. The former, introduced into North America about 1860 in Quebec, spread like the English Sparrow and Starling. Klots (1951) feels that its spread coincided with a major reduction in range and numbers of the native Mustard White (*Pieris napi*).

Breaking of land in the aspen parkland and adjoining prairies was widespread by the turn of the century and most of it has now been put to the plow. Vast areas are in wheat, barley, canola, oats, or are in summerfallow. Herbicides are used extensively for weed control. Small farms are disappearing and most farmers are using larger tractors and tillage equipment. Trees are being bulldozed down and fields are made larger. Ravines and temporary sloughs are being filled in. Gradual decreases in financial returns from beef cattle have resulted in many farmers breaking up pasture to put it into more profitable grain crops. Modern road construction largely removes native vegetation from the verges and there is a trend to remove fences and cultivate right up to the roads. Road allowances are commonly sprayed with 2,4D to control weeds and woody growth. Native vegetation along railroad right-of-ways is now threatened as branch lines are being eliminated. All of this has resulted in a major decrease in plant diversity. The populations of many butterflies have been drastically reduced because their food plants have been all but eliminated. Butterfly populations have been greatly effected by habitat destruction.

Habitat loss has also occurred through the cultivation of slough bottoms and the removal of trees and shrubs from the margin of more permanent water bodies. Merriam (1978) has shown that, between 1945-1949 and 1974, woody borders were reduced around

80 per cent of 913 sloughs studied in Alberta's aspen parkland and eliminated completely from 32 per cent. The average loss of border habitats was 1.0 ha per slough or 11.7 ha per quarter section of the 74 quarters studied.

Increasing land costs, poor financial returns, high interest rates, and the rapidly rising cost of living have resulted in ranchers selling out, breaking land and/or stocking their ranges to the limit. The first and second usually lead to habitat destruction. The last leads to a decrease in many of the most palatable and nutritious plant species (e.g. Rough Fescue) and an increase in the coarser and less nutritious species (e.g. Pasture Sage). This habitat change leads to the decrease of various butterfly species and the increase of others.

The long, cold winters prevalent in Alberta require that cattle be fed for a period of about six months. This feed is hay or a combination of hay, straw and grain. Large acreages have been planted to a mixture of one or more legumes, with alfalfa being used extensively in the prairies and parkland, and clovers in the areas of grey wooded soil, and grass (principally brome). Additionally, many pastures have been broken and seeded to a grass-legume mix. Butterflies dependent upon wild food plants no longer exist in hay land or tame pasture, while the Alfalfa Butterfly (*Colias philodice eriphyle*), whose larvae feed on alfalfa, has become abundant.

Calgary and Edmonton, and many smaller cities and towns, have been undergoing rapid expansion. While some small areas are left for parks, especially along streams, much native habitat continues to be destroyed. City sprawl has largely eliminated native prairie in the vicinity of Calgary. One of the few areas left is Nose Hill (Hallworth 1981). Most of the butterflies on the Hill are common and widespread, but the populations of species such as the Alberta and Varuna Arctics (*Oeneis alberta alberta* and *O. uhleri varuna*) and the Nitra and Zelicaon Swallowtails (*Papilio nitra* and *P. zelicaon gothica*) have declined. It is significant that a number of species have not been seen there in many years, and may now be extinct. These include the Carlota Checkerspot (*Chlosyne gorgone carlota*), Acmon and Pembina Blues (*Plebejus acmon lutzi* and *P. icarioides pembina*) and the Ruralis Checkered Skipper (*Pyrgus ruralis*).

To most, butterfly collecting is an absorbing scientific recreation but to some it is like stamp collecting. There is a desire to have a complete collection of all types and a strong demand among collectors for rarities. Most collecting in Alberta has been of a small scale and no harm has been done. Serious problems can exist, however, when extensive or mass collecting of rare species is done in spatially limited habitats.

Plateau Mountain, west of Nanton, is unique because its high, relatively flat summit has been accessible by means of a natural gas well service road. Many characteristic, and some rare, alpine species occur on the mountain (Bird 1975). It soon became popular with collectors all over the continent. While most have visited briefly and removed only a few insects, a few have left with large numbers of specimens. Such activities are deplorable as some of the most sought-after rarities, e.g. the Alberta and Astarte Fritillaries (*Boloria alberta* and *B. astarte astarte*), Arethusa and Snow's Coppers (*Lycaena phlaeas arethusa* and *L. snowi snowi*) and Bean's Arctic (*Oeneis melissa beani*) are unique to such limited areas and over-collecting could seriously set back, if not eliminate, the populations of such species.

No known extinctions of butterflies have occurred in Alberta in recorded history. Habitat destruction has, however, been extensive. If it continues, a number of species will become endangered, and may even be so now. More areas of native vegetation, such as natural areas and parks, need to be set aside and protected in regions where agri-

cultural and urban development are substantial, and farmers should be financially encouraged to protect wild areas that occur on their land.

While no Alberta butterflies are presently believed to be endangered, a number may well belong to the threatened category. It would be premature to attempt a list at this time. Research conducted to date has been of a general nature. No government-funded work has ever been directed to the matter. It is important that this be done.

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ALBERTA FISH SPECIES

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Only native species are included in this list. There is no known species which exists only in Alberta or any species with previously known reproductively viable populations in danger of becoming extinct. Given our current knowledge of fish distribution (which, however, is in some cases poor) there is no reason to believe that we have any endangered or threatened species in the province. It is often difficult to know whether species seldom collected in the province are really rare. When they are, it is probably seldom the result of man's activities. The status of the nominal subspecies of Longnose Dace (*Rhinichthys cataractae smithi*), described from Cave and Basin Hot Springs, is uncertain; it is being worked on by D.E. McAllister and his associates. Longnose Dace are present in the area but whether they represent the original form or not is not known. Of our approximately 50 species of native fishes, 10 are known from only a few localities (often from only a few specimens) or only occur in the Milk River.

A. Species known from only one locality or from only a few specimens

1. Round Whitefish (*Prosopium cylindraceum*). Known only from the Peace-Athabasca Delta. A reproductively viable population may not be present in Alberta.
2. Shortjaw Cisco (*Coregonus zenithicus*). Known only from Barrow Lake (Slave drainage). The taxonomic status of the Barrow Lake population is uncertain. It has some similarities to *C. alpenae* of the Great Lakes, a species which may be near extinction.
3. Deepwater Sculpin (*Myoxocephalus thompsoni* - formerly considered conspecific with *M. quadricornis*). Known only from Waterton Lakes.

B. Species known from only a few localities

4. Pygmy Whitefish (*Prosopium coulteri*).
5. Brassy Minnow (*Hybognathus hankinsoni*). Although common in the Milk River, the few northern relict populations are of interest.
6. Silver Redhorse (*Moxostoma anisurum*).
7. Logperch (*Percina caprodes*).

C. Species limited to, or nearly so, the Milk River

8. Western Silvery Minnow (*Hybognathus argyritis* - formerly considered conspecific with *H. nuchalis*). The taxonomic status of this form in Alberta requires verification.
9. Stonecat (*Noturus flavus*).
10. Mottled Sculpin complex (*Cottus bairdi* complex). The taxonomic status of Milk River sculpins is uncertain and is being worked on by Wayne Roberts.

D. Sports fishes having restricted distributions and/or known to have declined in numbers

11. Lake Sturgeon (*Acipenser fulvescens*). Present in North and South Saskatchewan Rivers. Its numbers have decreased markedly in the North Saskatchewan River since the turn of the century and its present status there is uncertain.
12. Bull Trout (*Salvelinus confluentus* - formerly considered conspecific with *S. malma*). Many populations have suffered marked decreases, probably due to environmental changes and overfishing. The species is, however, relatively widespread in the Rocky Mountains and adjacent regions.
13. Cutthroat Trout (*Salmo clarki*). Pure populations of the original form (i.e., not mixed with introduced stock) are relatively few.

THREATENED OR ENDANGERED NATIVE SPECIES OF AMPHIBIANS AND REPTILES OF ALBERTA¹

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ENDANGERED - A species or subspecies whose prospects for survival and reproduction within Alberta are in immediate jeopardy

THREATENED - A species or subspecies that is likely to become endangered within Alberta with continued deterioration of its environment

RARE - A species or subspecies that occurs in small numbers in Alberta and may become threatened if its environment deteriorates

Long-toed Salamander (*Ambystoma macrodactylum* Baird). Known only from a small number of disjunct populations. Status: Rare.

Northern Leopard Frog (*Rana pipiens* Schreber). Since 1978 this species has greatly declined in numbers and is not present over much of its former range in south central Alberta. Until the nature and extent of this decline is understood this species should be regarded as threatened within Alberta.

Western Painted Turtle (*Chrysemys picta belli* (Grey)). The only known natural breeding populations of this species within Alberta are in the lower Milk River Canyon and the Cypress Hills. The widely scattered records of individuals of this species in central and southern Alberta may be the result of introductions by man or perhaps represent very localized (and probably small) populations. Status: Endangered.

Eastern Short-horned Lizard (*Phrynosoma douglassi brevirostre* (Girard)). This species is known from only a small number of localities in southeastern Alberta. Status: Threatened.

Western Hognose Snake (*Heterodon nasicus* Baird and Girard). This rare species occurs in very low densities in restricted habitat. Status: Endangered.

The decline in numbers of Northern Leopard Frogs has been paralleled by declines in numbers of other anurans but to a lesser degree. The Canadian Toad (*Bufo americanus hemiophrys*) is much less abundant in central Alberta than Ft. McMurray. Whether or not all anurans have declined is uncertain.

The five species of snakes not specifically mentioned are vulnerable as they aggregate in communal hibernacula to overwinter. At such times all the snakes from a local area may be confined to a single location where human activities leading to destruction of the hibernaculum or killing or collecting large numbers of snakes can result in local extirpation.

¹. Nomenclature follows Cook, Francis R. 1980. Checklist of Amphibians and Reptiles of Canada. Canadian Amphibian and Reptile Conservation Society Bulletin, Vol. 18 No. 2. 6 pp.

ALBERTA BIRD SPECIES AT RISK

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The compilation of a list of bird species of Alberta "at risk" is a complex task that will never be complete, as more species meet new or increased risks and hopefully a few species recover. Indeed, a list of reviews of the various hazards to birdlife that have been published in the last five years or so would make a rather lengthy article in itself. In some ways, one could simply xerox the latest checklist of Alberta birds and state that they are all at risk.

A proper compilation requires a review of the status of each species occurring regularly in the province, a task that must fall on the shoulders of the revitalized AORC. In this paper, I shall restrict my discussion to two topics: first, a list of bird species on the Alberta list that have been placed on a World, North American, Canadian and/or Alberta list of rare, threatened and/or endangered species; and secondly a brief discussion on our current knowledge of these species in Alberta or on the factors known to be affecting their status here or elsewhere. I hope that this discussion will aid in compiling a more definite (albeit transient) list for Alberta, and point out species which require particular attention by field ornithologists in the province.

The terms "endangered", "threatened", "rare", etc. are used to convey a confusing array of interchangeable concepts. For the sake of consistency I have followed the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (n.d.) in using the term "at risk" to encompass all endangered, threatened, rare and extirpated species in Alberta.

In this paper I have not classified each species as endangered, threatened or rare in Alberta, as I believe any such classification should await a more thorough review and analysis. However, I propose that the COSEWIC (n.d.) definitions be adopted, as modified for Alberta, as follows:

- Endangered - Any indigenous species whose existence in Alberta is threatened with extirpation (or even extinction) in the near future if corrective action is not taken.
- Threatened - Any indigenous species whose existence in Alberta is not in immediate danger of extirpation in the province, but with recent population declines that will lead to an endangered status if they are not reversed.
- Rare - Any indigenous species which in Alberta naturally occurs in low numbers only. Such a species need not be endangered or threatened currently, but its low numbers make it vulnerable at all times.
- Extirpated - Any species once indigenous to Alberta which no longer exists within the boundaries of the province.

I also suggest that Weber's (1980) example in British Columbia of listing species which may be common in parts of Alberta, but which are threatened or endangered in a major area of the province, be listed as of special concern. This is particularly important in areas where major habitat changes are taking place. Examples would include Cypress Hills populations of species otherwise confined to the mountains, and

marsh-nesting species in marshes far removed from other marsh habitat.

In recent years, many countries, states and provinces have compiled various lists of endangered, threatened, rare and vulnerable birds (and often other taxonomic groups). At the world level, the International Council for Bird Preservation (ICBP) has published a list of Endangered Birds in the International Union for the Conservation of Nature (IUCN) "red book" series since 1966. This list is published on loose-leaf pages in a binder, so that each species (or race) can be updated as needed, but has recently been published in handbook form (King 1981). This is a list of all bird species or races considered endangered at the world level. I haven't had the nerve to count the number of taxa listed, but the handbook is over an inch thick! The U.S. Government has published a similar list for legal purposes (U.S. Dept. of the Interior, Fish and Wildlife Service 1976) which I find handy for quick reference.

For North America, the journal American Birds instituted an annual "blue list" in 1971. This list specifically excludes "red book" species, and is intended as an early warning list of North American species which are showing significant non-cyclical declines in at least part of their ranges. Some of the species included are common and widespread but appear to be in trouble at least somewhere. Tate (1981) recently reviewed the first ten years of the blue list.

In Canada, Godfrey (1970) offered a brief list of endangered species, and Goodwin (1977) commented that at least 66 species, or 12 per cent of the Canadian bird list, had been proposed for special attention at least once. More recently, COSEWIC (n.d.) published a brief list of species "at risk" in 1980. In 1979 the committee commissioned a series of preliminary reports on species on this list, and further reports on species not yet listed are in preparation.

In Alberta, a preliminary list of vulnerable birds was published by Ebel and Spalding (1974 and 1975). A proposed list has recently been prepared by the Edmonton Bird Study Group (hereafter EBSG) for discussion with the Calgary Bird Study Group. I have used this list, which was sent to me by David M. Ealey, in the following discussion. To date, there is no risk list for Saskatchewan, but Weber (1980) published a proposed list for British Columbia, to which I refer when appropriate in the following discussion.

ALBERTA BIRD SPECIES ON CURRENT RISK LISTS

Table 1 lists bird species on the latest Alberta bird checklist (Stepney 1981) that are on one or more of the International, Canadian and/or Alberta risk lists mentioned above. Exclusion from this list does not mean that a species is not in trouble in Alberta or elsewhere, but only that it has not yet been listed as in trouble. I have included all species that have been listed on the blue list, even if recently removed (Tate 1981), as I feel that any species that has been so listed should be assessed in Alberta. The following paragraphs note some of the threats facing species on the list and/or attempts to assess their status in Alberta.

Common Loon (*Gavia immer*). The Common Loon was added to the blue list in 1980 (Tate 1981). Declines of this species in eastern North America led to considerable concern there and a review of its status by the U.S. Fish & Wildlife Service has been requested (Sutcliffe 1979). Power boats swamping nests have long been a problem to this species, and acid rain poses a new threat (Tate 1981). Spalding (1974) commented that there is evidence that it is diminishing in more populated parts of Alberta, but its status in the province has not yet been reviewed in detail.

Arctic Loon (*Gavia arctica*). Ebel and Spalding (1974) listed this loon as vulnerable in Alberta because of its extremely limited distribution in the province.

TABLE 1. Alberta bird species reported at risk.

Species	International		Canada ³ .	Alberta ⁴ .
	Red Book ¹ .	Blue List ² .		
Common Loon		x		
Arctic Loon				E&S:peripheral; EBSG
Red-throated Loon		x		E&S:undetermined; EBSG
Red-necked Grebe		x		
Western Grebe		x		EBSG
White Pelican		x	Threatened	E&S:rare; EBSG
Double-cr. Cormorant		x	Not in any category	E&S:rare; EBSG
Great Blue Heron		x		E&S:rare; EBSG
Blk.-cr. Night Heron		x		E&S:peripheral; EBSG
American Bittern		x		
White-faced Ibis		x		EBSG
Trumpeter Swan		x	Rare	E&S:rare; EBSG
Ross' Goose				EBSG
Fulvous Tree Duck		x		
Black Duck		x		
Cinnamon Teal				E&S:peripheral; EBSG
Wood Duck				E&S:undetermined; EBSG
Canvasback		x		
Greater Scaup				E&S:undetermined
Barrow's Goldeneye				EBSG
Harlequin Duck				EBSG
Surf Scoter				E&S:undetermined
Hooded Merganser				EBSG
Turkey Vulture		x		EBSG
Goshawk				EBSG
Sharp-shinned Hawk		x		E&S:rare; EBSG
Cooper's Hawk		x		EBSG
Broad-winged Hawk				E&S:peripheral; EBSG
Swainson's Hawk		x		
Ferruginous Hawk		x		E&S:uncertain; EBSG
Golden Eagle				E&S:more infor. needed; EBSG
Bald Eagle	x			E&S:endangered; EBSG
Marsh Hawk		x		EBSG
Osprey		x		E&S:endangered; EBSG

Species	International Red Book ¹ .	Blue List ² .	Canada ³ .	Alberta ⁴ .
Gyr Falcon			Not in any category	EBSG
Prairie Falcon		x		E&S: endangered; EBSG
Peregrine Falcon	x		<i>anatum</i> : en- dangered <i>tundrius</i> : threatened	E&S: endangered; EBSG
Merlin		x		E&S: unknown
American Kestrel		x		E&S: declining
Willow Ptarmigan				EBSG
Wht.-tailed Ptarmigan				EBSG
Greater Prairie Chicken			Endangered	EBSG: "extinct" (sic- extirpated)
Sharp-tailed Grouse		x		EBSG
Sage Grouse		x		E&S: rare; EBSG
Bobwhite		x		
Turkey				EBSG
Whooping Crane	x		Endangered	E&S: "extinct" (sic-extir- pated); EBSG
Sandhill Crane			Greater race, Not in any category	
Virginia Rail				E&S: unknown; EBSG
Yellow Rail				E&S: little known; EBSG
Semipalmated Plover				EBSG
Piping Plover		x	Threatened	E&S: unknown; EBSG
Snowy Plover		x		
Mountain Plover				E&S: endangered; EBSG
Long-billed Curlew		x		EBSG
Upland Sandpiper		x		E&S: not classified; EBSG
Willet				EBSG
Sht.-billed Dowitcher				E&S: rare
Marbled Godwit				EBSG
Hudsonian Godwit				EBSG
American Avocet				EBSG
Blk.-necked Stilt				EBSG
Forster's Tern				E&S: unknown; EBSG
Common Tern		x		
Caspian Tern			Rare	E&S: undetermined; EBSG

Species	International		Canada ^{3.}	Alberta ^{4.}
	Red Book ^{1.}	Blue List ^{2.}		
Black Tern		x		
Ancient Murrelet		x		
Yellow-billed Cuckoo		x		
Blk.-billed Cuckoo		x		E&S:peripheral; EBSG
Screech Owl		x		EBSG
Pygmy Owl				E&S:peripheral; EBSG
Burrowing Owl	x		Threatened	E&S:threatened; EBSG
Barred Owl				E&S:unknown; EBSG
Great Gray Owl			Rare	E&S:unknown
Long-eared Owl		x		
Short-eared Owl		x		
Boreal Owl				E&S:unknown
Poor-will				EBSG
Common Nighthawk		x		EBSG
Black Swift				E&S:severely limited; EBSG
Ruby-thr. Hummingbird		x		
Calliope Hummingbird		x		
Common (Red-sh.) Flicker		x		
Pileated Woodpecker				EBSG
Red-headed Woodpecker		x		
Lewis' Woodpecker		x		E&S:peripheral; EBSG
Hairy Woodpecker		x		
Blk.-backed 3-toed Woodp.				E&S:unknown
Scissor-t. Flycatcher		x		
Great Crested Flycatcher				EBSG
Eastern Phoebe		x		
Yellow-bellied Flyc.				E&S:poorly known
Willow Flycatcher		x		
Least Flycatcher		x		
Western Flycatcher				E&S:unknown
Rough-winged Swallow				EBSG
Cliff Swallow		x		
Purple Martin		x		EBSG
Wht.-br. Nuthatch				E&S:unknown
Brown Creeper				E&S:unknown
American Dipper				E&S:unknown

Species	International		Canada ³ .	Alberta ⁴ .
	Red Book ¹ .	Blue List ² .		
House Wren		x		
Winter Wren		x		E&S:unknown
Sht.-billed Marsh Wren		x		EBSG
Nor. Mockingbird				E&S:unknown; EBSG
Eastern Bluebird		x		
Mountain Bluebird		x		EBSG
Golden-cr. Kinglet		x		
Ruby-cr. Kinglet		x		
Sprague's Pipit				EBSG
Northern Shrike				EBSG
Loggerhead Shrike		x		EBSG
Warbling Vireo		x		
Nashville Warbler				EBSG
Yellow Warbler		x		
Townsend's Warbler				E&S:nesting unproven
Blackburnian Warbler				E&S:nesting unproven; EBSG
Chestnut-sided Warbler				E&S:nesting unproven; EBSG
Pine Warbler				E&S:unknown
Common Yellowthroat		x		
Yellow-br. Chat		x		E&S:unknown; EBSG
Canada Warbler				E&S:nesting unproven
Bobolink				EBSG
Nor.(Bullock's) Oriole				E&S:peripheral
Blk.-headed Grosbeak				E&S:reduced; EBSG
Lazuli Bunting				E&S:unknown; EBSG
Dickcissel		x		
Cassin's Finch				E&S:limited range; EBSG
House Finch				EBSG
Rufous-sided Towhee				EBSG
Lark Bunting				EBSG
Grasshopper Sparrow		x		E&S:little infor.; EBSG
Baird's Sparrow				EBSG
LeConte's Sparrow		x		
Sharp-tailed Sparrow		x		EBSG
Vesper Sparrow		x		
Lark Sparrow				EBSG

Species	International		Canada ³ .	Alberta ⁴ .
	Red Book ¹ .	Blue List ² .		
Brewer's Sparrow				EBSG
Golden-cr. Sparrow				EBSG
Fox Sparrow		x		
Swamp Sparrow				EBSG
McCown's Longspur				EBSG

1. Listed in, and reviewed in King (1981).
2. Included on the Blue List in one or more of its first 10 years. See text for current status of listing of each species.
3. Listed on the 1980 list by COSEWIC (n.d.).
4. E&S = status assigned by Ebel and Spalding (1974, 1975). EBSG = listed on proposed Alberta risk list by Edmonton Bird Study Group.

Red-throated Loon (*Gavia stellata*). The Red-throated Loon was included on the Blue List from 1973 through 1976, inclusive, but has since been removed (Tate 1981). Ebel and Spalding (1974) included it as vulnerable in Alberta, because of its possible breeding as a peripheral species in the Caribou Mountains. Its breeding there has since been established (Höhn 1976).

Red-necked Grebe (*Podiceps grisegena*). The Red-necked Grebe has been on the Blue List since 1974 (Tate 1981). Although the COSEWIC (n.d.) list does not include this species on Canada's risk list, Ken De Smet (pers. comm.) was preparing a report on it for the COSEWIC committee about two years ago, and it will likely be added to their list in the near future.

Western Grebe (*Aechmophorus occidentalis*). This species has been on the Blue List since 1973 (Tate 1981), and is on the proposed Alberta list of the EBSG. Weber (1980) considered Western Grebe as threatened in British Columbia. I am not aware of any recent review of the populations of this species in Alberta or on the prairies.

White Pelican (*Pelecanus erythrorhynchos*). The White Pelican has been Blue Listed since 1972, and is considered by some to belong on the endangered list (Tate 1981). This species is highly susceptible to disturbance by human observers (e.g. Markham and Brechtel 1979; Bunnell et al. 1981; Sidle and Ferguson 1982; and many earlier authors cited in these papers). COSEWIC (n.d.) listed it as threatened in Canada, Ebel and Spalding (1974) as rare in Alberta, and Weber (1980) as endangered in British Columbia. Its status in Canada (and North America generally) has been reviewed several times (see Markham 1979a; Sidle and Ferguson 1982 for references). The most recent review in Alberta is the paper by Markham and Brechtel (1979). The recommendation by Sidle and Ferguson (1982) that North American colonies be monitored regularly by low disturbance techniques should be followed up. Of particular concern in Alberta is a colony on the Slave River rapids, which is threatened by power developments (Van Pelt 1974, 1976; Griffiths 1980). Although the White Pelican is recognized as endangered in Alberta by the provincial government, and most of its colonies are legally protected (Brechtel 1978), this protection does not at present extend to the Slave River colony.

Double-crested Cormorant (*Phalacrocorax auritus*). Alberta's only cormorant species has been on the Blue List since 1972, but increases over a wide area suggest that it may soon be removed (Tate 1981). Although listed by COSEWIC (n.d.) on the Canadian risk list, COSEWIC did not assign a particular risk status to it. Ebel

and Spalding (1974) classified it as rare in Alberta, and the provincial government has designated it as an endangered species and assigned protective legislation to several colony sites (Brechtel 1978). This species has shown dramatic increases in Alberta and other prairie provinces recently (Markham 1979b; Markham and Brechtel 1979), and, thus, although its populations should be monitored regularly, concern for it has lessened.

Great Blue Heron (*Ardea herodias*). The Great Blue Heron has been on the Blue List for only two years, and was added because of problems in the east (Tate 1981). However, Ebel and Spalding (1974) classed it as rare in Alberta, and felt it might be declining in the province, and Markham and Brechtel (1979) considered its numbers as currently stable but declining in the long term. Weber (1980) also felt that this species is of special concern in British Columbia. Hjertaas (1982) found evidence of egg-shell thinning, presumably related to pesticides, in Saskatchewan, and attributed the main problem there to predation by Raccoons (*Procyon lotor*), a species currently expanding its range in the prairie provinces. Clearly, monitoring of this species is important. Fortunately, the Great Blue Heron is now the subject of a nation-wide monitoring effort (DesGranges 1980).

Black-crowned Night Heron (*Nycticorax nycticorax*). This small heron has been on the Blue List continually since 1972, but may soon be removed, as it appears to be recovering (Tate 1981). Although a common breeding bird in parts of Manitoba and Saskatchewan, the night heron is relatively new as a breeding species in Alberta (Wolford and Boag 1971) and its breeding localities to date have been erratic (Salt and Salt 1976). Its peripheral status makes its continued breeding in the province somewhat uncertain (Ebel and Spalding 1974).

American Bittern (*Botaurus lentiginosus*). Although the bittern was not listed by either Ebel and Spalding (1974) or the EBSG as vulnerable in Alberta, it has been on the Blue List since 1976, with "universal support" for its listing in the most recent edition (Tate 1981). I am not aware of any thorough survey of its breeding status in Alberta, and its secretive behaviour would make a decline difficult to detect. Weber (1980) classed this heron as of special concern in British Columbia because of scarcity of breeding habitat. The continued draining and filling of marshes in the prairie provinces poses a threat to the species here, too.

White-faced Ibis (*Plegadis chihi*). The White-faced Ibis was on the Blue List from 1972 to 1979, but has been delisted (Tate 1981). The EBSG listed it on their proposed Blue List for Alberta, presumably as a peripheral breeding species. It has nested at Pakowki Lake (Salt and Salt 1976), but the regularity or otherwise of its breeding in the province has yet to be defined.

Trumpeter Swan (*Olor buccinator*). The Trumpeter Swan is among the few species naturalists rejoice to see on the Blue List, for it was previously on the endangered list. Even its Blue List status was retained in 1981 only because the lists' editor felt its removal would be premature (Tate 1981). In Alberta, the main breeding population is in the vicinity of Grande Prairie (Lloyd 1922; Ebel and Spalding 1974; Salt and Salt 1976; Mackay 1979), where the population has recently been estimated at about 200 breeding birds (Mackay 1979). It has also been known to nest in the vicinity of Brooks, the Cypress Hills, the Hand Hills and Longview (Lister 1951; Salt and Salt 1976; Mackay 1979; A. Hogg, pers. comm.). Although we can be heartened by its recovery from danger of extinction, the Trumpeter Swan Naturalists reported potential threats to its main Alberta nesting ground in both the Northern Naturalist and the club news section of the Alberta Naturalist from time to time, and all its reported nesting areas should be monitored regularly.

Ross' Goose (*Chen rossii*). Ross' Goose is only migrant through Alberta, where the greatest numbers pass through the relatively unpopulated and little-birded eastern portion (Salt and Salt 1976). Its similarity to the slightly larger Snow Goose (*C. caerulescens*) makes its status difficult to determine, and as this is the rarest of Alberta geese (Salt and Salt 1976), I concur with the EBSG recommendation to include this species on Alberta's vulnerable bird list.

- Fulvous Tree (Whistling) Duck (*Dendrocygna bicolor*). I have included this distinctive duck here only for the sake of completeness. The species was on the Blue List from 1972 until 1979 inclusive (Tate 1981), but its status in Alberta is only as an accidental (Stepney 1981), and I am not aware of any published information which substantiates even that occurrence in the province.
- Black Duck (*Anas rubripes*). The Black Duck is considered "accidental" in Alberta by Stepney (1981), but the number of records (see Salt and Salt 1976) and its slow expansion into eastern parts of the prairies suggest that it is at least a regular rarity which can be expected in the future. It has been Blue Listed since 1980 because of genetic swamping through hybridization with the closely-related Mallard (*A. platyrhynchos*) (Tate 1981). Such hybridization might be expected in fringes of its range where more appropriate mates are lacking or scarce, and indeed hybrid Mallard x Black Ducks have been reported in Alberta (Salt and Salt 1976).
- Cinnamon Teal (*Anas cyanoptera*). This western species occurs in Alberta in a relatively small area of southwestern prairies (Salt and Salt 1976), and although it can be found readily by searching in the right areas, it was included as vulnerable in Alberta by Ebel and Spalding (1974) on the basis of its peripheral status. Its status in the Calgary area was reviewed by Lang *et al.* (1972), where it was considered well-established and probably slowly increasing.
- Wood Duck (*Aix sponsa*). Like the Black Duck, this species reaches the northwestern edge of its breeding range in Alberta (although a western component also breeds in coastal B.C.), and it can be considered a peripheral breeding in the province. As pointed out by Ebel and Spalding (1974, its status in Alberta is poorly known. The Wood Duck was of some concern in the main part of its range several years ago, but extensive nest box programs have removed it from most concerned lists (e.g. Burger and Webster 1964).
- Canvasback (*Aythya valisineria*). The Canvasback has been on the Blue List since 1975 (Tate 1981), and many observers feel that hunting of it should be prohibited at present. Alberta Canvasbacks winter primarily on the west coast, where hunting is not as heavy as in more eastern areas (Geis 1974).
- Greater Scaup (*Aythya marila*). Ebel and Spalding (1974) listed the Greater Scaup as vulnerable in Alberta because of its undetermined population size. Salt and Salt (1976) considered it as a rare transient in Alberta, but its occurrence in the province may be obscured by difficulty in distinguishing it from the more common Lesser Scaup (*A. affinis*).
- Barrow's Goldeneye (*Bucephala islandica*). This common mountain diving duck was listed by the EBSG, presumably because of limited habitat in Alberta.
- Harlequin Duck (*Histrionicus histrionicus*). Another duck of mountains, this species is even more restricted in habitat than the goldeneye, as it requires fast flowing streams during the breeding season. Listed by the EBSG, presumably because of restricted habitat and little documentation of breeding range in Alberta.
- Surf Scoter (*Melanitta perspicillata*). Ebel and Spalding (1974) included this scoter on their list of vulnerable Alberta birds because of its uncertain status, and Salt and Salt (1976) also commented that its status in Alberta needs clarification. Although it probably breeds in the boreal forest in the northeast, its populations there have not been adequately assessed to date.
- Hooded Merganser (*Lophodytes cucullatus*). The EBSG list includes this hole-nesting boreal forest duck, presumably because of its limited known breeding range in Alberta. As noted by Salt and Salt (1976), breeding records to date have come from only the Rocky Mountains, but it probably also breeds in the northern boreal forest. A thorough survey of its breeding range in Alberta is needed.
- Turkey Vulture (*Cathartes aura*). Our only vulture was included on the Blue List in 1972 and 1980, but its population problems appear to be local only (Tate 1981). In Alberta, Salt and Salt (1976) considered it a "rare and local" breeding species, with a present breeding population much reduced from previous numbers.

- Goshawk (*Accipiter gentilis*). The EBSG listed this large accipiter on their proposed risk list, presumably because of its high position on the food chain. Fyfe (1976a) listed the Goshawk as of medium to high abundance in the prairie provinces, with cyclic population trends. For Canada as a whole, he (Fyfe 1977) considered it as fluctuating, with low toxic chemical residue levels.
- Sharp-shinned Hawk (*Accipiter striatus*). Our smallest accipiter has been on the Blue List continuously since 1972 and continues to decline (Tate 1981). Ebel and Spalding (1974) considered its numbers in Alberta to vary from year to year. Fyfe (1976a) classed its abundance as medium, with stable populations in the prairie provinces and (Fyfe 1977) stable to increasing in Canada as a whole, with low to medium toxic chemical residue levels.
- Cooper's Hawk (*Accipiter cooperii*). Cooper's Hawk has also been on the Blue List since 1972, but seems to be improving in more areas than its smaller cogener and may soon be removed from the list (Tate 1981). Fyfe (1976a) considered its populations stable and of medium abundance in the prairie provinces and (Fyfe 1977) noted that its toxic chemical levels are low to medium in Canada.
- Broad-winged Hawk (*Buteo platypterus*). This small buteo was listed as peripheral by Ebel and Spalding (1975), and the EBSG list has retained it. Fyfe (1976a, 1977) considered it relatively abundant in both Canada as a whole, and the prairies specifically, with stable populations.
- Swainson's Hawk (*Buteo swainsonii*). Swainson's Hawk has been on the Blue List since 1972, with loss of grassland habitat its most significant problem (Tate 1981). Fyfe (1976a) considered its abundance in the prairie provinces as medium to high. He (Fyfe 1977) considered its population as stable or increasing in Canada as a whole, but (Fyfe 1976a) as in decline or stable in the prairie provinces. Fyfe (1977) listed toxic chemical residue levels as low to medium in this species.
- Ferruginous Hawk (*Buteo regalis*). The Ferruginous Hawk has also been Blue Listed since 1972, but management through artificial nest sites has apparently resulted in some increase recently (Tate 1981). Fyfe (1976a) considered it of rare to medium abundance with stable populations, and (Fyfe 1977) listed its toxic chemical residue levels as low. Ebel and Spalding (1976) noted its vulnerability to shooting and disturbance at the nest, and Salt and Salt (1976) commented on these factors and earlier poison campaigns against ground squirrels, its main food supply, as important in reducing its numbers. Weber (1980) classed it as of uncertain status in British Columbia, endangered if breeding. COSEWIC (n.d.) did not include it on their 1980 risk list for Canada, but have since commissioned a status report on it (Sheila Schmutz, pers. comm.). To date, I have not seen any announcement of availability of this report.
- Golden Eagle (*Aquila chrysaetos*). Both Ebel and Spalding (1975) and the EBSG list the Golden Eagle as vulnerable in Alberta, and the statement by Ebel and Spalding (1975) that more information on population size is "greatly needed" is still true today. Fyfe (1976a, 1977) considered its population as stable, with rare to low numbers in the prairie provinces and in Canada generally. He (Fyfe 1977) listed its toxic chemical levels as low.
- Bald Eagle (*Haliaeetus leucocephalus*). The Bald Eagle has been on the international endangered list for several years (King 1981), but this status applies primarily to the southern race. Godfrey (1970) listed it among Canada's endangered birds, primarily because of pesticide poisoning, but COSEWIC (n.d.) did not include it on their more recent list. Fyfe (1976a) considered it of low to medium abundance in the prairie provinces with stable populations, and also considered its populations as stable in Canada as a whole except for declines in Ontario (Fyfe 1977). He (1977) classed its current toxic chemical levels as low to medium. In Alberta there are occasional reports of concentrations in migrations in the south (e.g. Minty and Minty 1974), but its breeding populations are primarily in the northern boreal forest, where its numbers are poorly known (Ebel and Spalding 1975), although localized data are available (e.g. Salter 1974a,b; Schaafsma 1975).

- Marsh Hawk (*Circus cyaneus*). The Marsh Hawk or Northern Harrier has been on the Blue List since 1972 and its "clearly having trouble" in most of its range in North America (Tate 1981). Fyfe (1976a) characterized its abundance in the prairie provinces as low to medium with wide fluctuations in populations. Its toxic chemical residue levels in Canada were assessed as low to medium (Fyfe 1977).
- Osprey (*Pandion haliaetus*). The cosmopolitan "fish hawk" suffered serious declines which should have put it on the Red Data Book list, but its populations began to recover before the gravity of its situation was realized (Tate 1981). Although still threatened (Tate 1981), it has been the subject of considerably research and shows much promise for recovery partly because it responds well to artificial nest structures, partly because it will nest in virtually colonial densities where suitable nest structures and food are available, and partly because it adapts well to human disturbance if such intrusion does not directly threaten it (e.g. papers in Ogden 1977; Postupalsky 1978; Van Daele 1980; Poole 1981; and many earlier papers cited by these authors). Its drastic decline was apparently pesticide induced (Godfrey 1970; Weber 1980; Tate 1981; and papers cited therein). Godfrey (1970) considered the species endangered in Canada, and Ebel and Spalding (1975) applied this classification to Alberta. Weber (1980) classed it as of special concern in British Columbia. Fyfe (1976a) considered its prairie province populations as low to medium and stable, and he (1977) listed current toxic chemical residue levels as low to medium in Canada.
- Gyr Falcon (*Falco rusticolus*). The status of this largest North American falcon is poorly known. Its numbers are naturally low, but little is known of population trends (Fyfe 1977). Although there is a historical breeding record in Alberta on Lake Athabasca (Martin 1979a), its recent status is that of a migrant and wintering bird (Fyfe 1976a; Salt and Salt 1976; Dekker 1977). Although recent pesticide levels have been low (Fyfe 1977), it faces recent threats of legalized nest robbing for falconry (Sheppard 1982).
- Prairie Falcon (*Falco mexicanus*). The Prairie Falcon was on the Blue List from 1972 to 1980 inclusive, but removed in 1981 because of improved status in most of its range (Tate 1981). Godfrey (1970) considered it endangered in Canada because of declines apparently related to pesticides. Van Tighem (1967) documented loss of nests and clutches near Calgary through shooting and egg collecting, and Edwards (1973) noted a marked decline in a study area also near Calgary, and attributed this decline to human disturbance. Ebel and Spalding (1975) included the Prairie Falcon on their vulnerable list for Alberta, but noted suggestions that it may be replacing Peregrines where that species has disappeared, and Tate (1981) commented on its ready acceptance of artificial nest platforms. Weber (1980) considered it of special concern in British Columbia. Fyfe, whose studies documented its decline and demonstrated problems with toxic chemicals, recently (1976a, 1977) considered its populations to be of medium abundance and stable or increasing, with low to medium toxic chemical levels.
- Peregrine Falcon (*Falco peregrinus*). The Peregrine has long been on the World endangered list, on which is it classed as vulnerable as a species with the race breeding in Alberta, *F. p. anatum*, considered endangered and *F. p. tundrius*, which migrates through Alberta also classed as endangered (King 1981). In Canada, Godfrey (1970) considered *F. p. anatum* endangered and COSEWIC (n.d.) retained this classification and listed *F. p. tundrius* as threatened. Ebel and Spalding (1975) also classed the Peregrine as endangered in Alberta, and Weber (1980) listed it as threatened in British Columbia. The status of the Peregrine in North America has been monitored closely for several years (Cade and Fyfe 1970; Cade 1975; Fyfe et al. 1976; Martin 1979b; Anonymous 1981). Research into the causes of decline has been intensive, with pesticides found to be the main problem (Peakall 1974, 1976). An ambitious recovery program involving captive breeding and release into the wild has been undertaken by Cornell University, the Canadian Wildlife Service, and other groups (see Fyfe 1976b, 1978; Cade and Fyfe 1978; Fyfe et al. 1978). These efforts have

met with considerable success (see McNicholl 1981), but both *F. p. anatum* and *F. p. tundrius* continue to decline (Fyfe 1976a, 1977), and toxic chemical levels are still high in many populations (Fyfe 1977, and verbally at American Ornithologists' Union meeting in Edmonton, August 1981). In Alberta, the Peregrine formerly nested in the south (Dekker 1967; Salt and Salt 1976), and captive-bred birds have recently nested in the north (Fyfe et al. 1978), but the species is now seen primarily as a migrant (Dekker 1979).

Merlin (*Falco columbarius*). The Merlin has been on the Blue List since 1972 and there is little support for deleting it, although its breeding status needs clarification (Tate 1981). The Richardson's race of this species, which breeds on the prairies, showed declines a few years ago (Fyfe 1977; Houston and Schmidt 1981), and it was considered endangered in Canada by Godfrey (1970). Ebel and Spalding (1975) commented that its status in Alberta is unknown. In recent years it has shown an apparent increase (Fyfe 1976a, 1977), with medium to high levels of toxic chemical residues (Fyfe 1977). The species has become quite common in some prairie cities, notably Edmonton and Saskatoon (Smith 1978, 1981; Houston and Schmidt 1981).

American Kestrel (*Falco sparverius*). Our smallest falcon has been Blue Listed since 1972, and although there is considerable opposition to its continued listing, it continues to cause concern in large parts of its range (Tate 1981). In Alberta, Ebel and Spalding (1975) stated that monitored populations have declined, and the Salts were concerned about a decrease in observations in the Pigeon Lake area three or four years ago (J.R. Salt, pers. comm.). Fyfe (1976a) classed it as of high populations that are stable in the prairie provinces, and (Fyfe 1977) with low to medium toxic chemical levels. Tate (1981) suggested that nest box programs should be implemented where numbers are declining.

Willow Ptarmigan (*Lagopus lagopus*). The EBSG list includes this species, presumably because of its very limited breeding range in the Rocky Mountains of Alberta (Salt and Salt 1976). I am not aware of any recent census of this population.

White-tailed Ptarmigan (*Lagopus leucurus*). This ptarmigan of the mountains was also placed on the EBSG list, and like the Willow, its range in Alberta is limited, though more extensive in Alberta than the Willow (Salt and Salt 1976).

Greater Prairie Chicken (*Tympanuchus cupido*). The Greater Prairie Chicken or Pinnated Grouse formerly bred through much of Manitoba, Saskatchewan and Alberta, but the latest breeding record in Alberta was in 1934 (Ebel and Spalding 1975). Although occasional sightings are still reported (Salt and Salt 1976; Anweiler in Saskatchewan Department of Tourism and Renewable Resources 1979). Godfrey (1970) regarded it as endangered in Canada, a classification retained by COSEWIC (n.d.). On the prairies, it is probably extirpated as a breeding species (Ebel and Spalding 1975; Johnston and Smoliak 1976).

Sharp-tailed Grouse (*Pedioecetes phasianellus*). The Sharp-tailed Grouse was added to the Blue List in 1972 for one year, than reinstated in 1978 from which date it has been retained (Tate 1981). Habitat loss is considered the major problem, with hunting pressure also important at least locally (Tate 1981). The EBSG recommends listing it for Alberta.

Sage Grouse (*Centrocercus urophasianus*). The largest North American grouse has been on the Blue List since 1972 and is susceptible to habitat loss and hunting pressure (Tate 1981). Its range is very restricted in Alberta and it is considered scarce or rare where it does occur (Ebel and Spalding 1975; Salt and Salt 1976). Thus, its status as an Alberta species is vulnerable to habitat changes and/or hunting.

Bobwhite (*Colinus virginianus*). This tiny quail has been on the Blue List for two years (Tate 1981). It was introduced into Alberta in 1907 and later, and although very rare or extirpated, it has nested as recently as 1969 and has been shot by hunters as recently as 1974 (Salt and Salt 1976), so a limited population may persist.

Turkey (*Meleagris gallopavo*). EBSG lists the Turkey on its proposed provincial risk list. This species has been introduced into at least three areas of Alberta, but populations are not large in any of them (Salt and Salt 1976).

- Whooping Crane (*Grus americana*). This large spectacular crane once bred widely in the prairie provinces, but shooting and habitat loss eliminated these nesting populations (Godfrey 1970). Eventually it was brought to the brink of extinction and has long been considered endangered at a World level (King 1981). Efforts to save the Whooping Crane have been intensive and well-publicized, and include captive breeding programs and the establishment of a second flock through cross-fostering with Sandhill Cranes, resulting in a continuing slow increase (Godfrey 1970; Kuyt 1976; Drewien and Bizeau 1978; Kepler 1978; Gollop 1979). In Alberta, it was long ago extirpated as a nesting species on the prairies (Ebel and Spalding 1975), but still occurs as a migrant (Salt and Salt 1976), although most of the migratory movement in Canada is through Saskatchewan. The only known current nesting populations is in Wood Buffalo National Park, and until recently was restricted to the Northwest Territories portion of the park. However, it was recently reinstated as an Alberta breeding bird by nesting in the Alberta portion of the park (Kuyt 1978).
- Sandhill Crane (*Grus canadensis*). Godfrey (1970) considered the Greater race of this species to be endangered and COSEWIC (n.d.) have listed it as at risk without classifying its risk status. Although this is not the common race occurring in Alberta, I have included it here because of the predication by Miller (1974) that current management practices will lead to serious trouble for the species. For this reason, naturalists should be alerted to possible declines.
- Virginia Rail (*Rallus limicola*). Ebel and Spalding (1975) included this secretive bird on their vulnerable list because of its poorly-known status in Alberta, and EBSG also suggested listing it. Marsh drainage certainly poses a potential threat to all rails, and a detailed assessment of its status in Alberta is needed.
- Yellow Rail (*Coturnicops novaboracensis*). This small rail is even less known than the Virginia, and Ebel and Spalding (1975) commented that increased land demands threatened its habitats. Nordstrom (1978) summarized and mapped its known distribution in Alberta, and known sites should be checked regularly.
- Semipalmated Plover (*Charadrius semipalmatus*). The EBSG listed this species, presumably because of its presumed peripheral breeding status in northeastern Alberta (Salt and Salt 1976). This status has recently been confirmed by nesting evidence in Wood Buffalo National Park (Kuyt 1982). It is fairly common as a migrant in southern and central Alberta.
- Piping Plover (*Charadrius melodus*). This small shorebird has been on the Blue List since 1973 and perhaps should be considered for endangered status (Tate 1981). Piping Plovers are threatened by disturbance on their beach nesting habitat, and the species is considered threatened in Canada by COSEWIC (n.d.). Its status in Canada was reviewed by Bell (1979) and Renaud et al. (1979) presented a thorough review of its status and breeding sites in Saskatchewan. Ebel and Spalding (1975) commented that its population size and breeding distribution in Alberta are unknown. Chip and Linda Weseloh have recently completed an as yet unpublished manuscript reviewing its distribution in Alberta, and discussing several biological aspects. They tentatively concluded that its populations in the province are currently stable, but its nesting sites should be checked regularly.
- Snowy Plover (*Charadrius alexandrius*). The Snowy Plover has been on the Blue List since 1972 (Tate 1981) and is included here only as an accidental in Alberta (Dekker 1975).
- Mountain Plover (*Charadrius montanus*). Ebel and Spalding (1975) considered this prairie species as unable to cope with encroachments on its habitat and thus endangered. Until recently there were few records in Alberta (Salt and Salt 1976), but its nesting in the province has now been established (Wallis and Loewen 1980), and it now appears to be a rare but regular breeding species in extreme southeastern Alberta and southwestern Saskatchewan (Wallis and Wershler 1981). Its populations should be monitored regularly.
- Long-billed Curlew (*Numenius americana*). This large shorebird was placed on the Blue List in 1981, with "agricultural changes" cited as threatening it. Its range in

Alberta is restricted primarily to the southeastern prairies (Salt and Salt 1976), and the EBSG has suggested listing it as of concern in the province. Weber (1980) also considered it of special concern in British Columbia. A thorough review of its status in Alberta like that published by Renaud (1980) for Saskatchewan (including some Alberta locations) is warranted.

Upland Sandpiper (*Bartramia longicauda*). This sandpiper has been on the Blue List continuously since 1975, and its decline seems to have been little monitored (Tate 1981). Ebel and Spalding (1975) and Salt and Salt (1976) both commented on the role of loss of habitat in reducing its numbers in Alberta. Lang and Lang (1973) reviewed its status in the Calgary area, but a thorough review for the whole province is also needed.

Willet (*Catoptrophorus semipalmatus*) EBSG listed this species on their proposed list, presumably because its prairie slough habitat is restricted to southern and east-central Alberta (Salt and Salt 1976).

Short-billed Dowitcher (*Limnodromus griseus*). Ebel and Spalding (1975) classified this long-billed shorebird as rare in Alberta because of limited breeding habitat. Salt and Salt (1976) mapped it as breeding in a broad area of boreal forest in northern Alberta, but commented that differentiation of its range from that of the closely related Long-billed Dowitcher (*L. scolopaceus*) has not been thoroughly assessed.

Marbled Godwit (*Limosa fedoa*). This is another large, long-billed sandpiper whose breeding range in Alberta is restricted to prairie areas in southern and central-eastern parts of the province (Salt and Salt 1976). EBSG placed it on their proposed list, presumably on the basis of its relatively limited range and susceptibility to agricultural changes.

Hudsonian Godwit (*Limosa haemastica*). The EBSG listed this arctic breeding Alberta migrant on their proposed risk list. Salt and Salt (1976) stated that it is a regular migrant in small numbers in eastern Alberta. It was once considered threatened, but appears to be in fairly healthy numbers at present (Johnsgard 1981).

American Avocet (*Recurvirostra americana*). The EBSG included this large, noisy wader on their list, presumably because of its need for shallow sloughs or marshes for nesting. Although quite common in Alberta, it is confined by habitat to southern and east-central parts of the province (Salt and Salt 1976). Kondla and Pinel (1973) presented a preliminary map of nesting locations in the province, which should serve as a useful starting point for a thorough update.

Black-necked Stilt (*Himantopus mexicanus*). The EBSG list includes this striking bird, which is generally considered accidental in Canada, but which may move into the prairies during drought parts of long-term wet/dry cycles. There have been several sightings in the prairie provinces in recent years (see review by McNicholl *et al.* 1972), and in 1977 there were several observations in Alberta, culminating in the discovery of two nests at Beaverhill Lake (Bulmer 1977; McNicholl 1978; Bogaert 1979; Dekker *et al.* 1979).

Forster's Tern (*Sterna forsteri*). Ebel and Spalding (1975) attributed fluctuating water levels and vandalism as possible threats to this species. In fact, it is well-adapted to fluctuating water levels, changing colony locations as old sites become too shallow or are washed out (McNicholl 1975a), but their dependence on open, deep-water marshes makes them susceptible to long-range marsh drainage (McNicholl 1975b). Gerrard and Whitfield (1971) summarized their known nesting areas and probable nesting areas in Alberta to which Salt and Salt (1976) added a few more. I have also been informed that it has nested at Frank Lake (C.R. Wershler, pers. comm.).

Common Tern (*Sterna hirundo*). The Common Tern has been on the Blue List since 1978, with gull predation and disturbance by humans and their domestic animals considered the main problems (Tate 1981). It breeds in suitable habitat in much of Alberta (Salt and Salt 1976). Switzer *et al.* (1971, 1973) studied reproductive success in relation to DDE residues at Chip Lake, and concluded that DDE was not in itself a significant cause of nest failure. However, Fox (1976) found that even low levels of DDE affect shell thickness and thereby hatching success and also visual perception of chicks in a study at Buffalo Lake.

- Caspian Tern (*Sterna caspia*). This very large tern is considered rare in Canada by COSEWIC (n.d.). In Alberta, its only known nesting locality is Egg Island in Lake Athabasca (Ebel and Spalding 1975; Salt and Salt 1976; Martin 1979c; Weseloh and Cocks 1979), and this colony should obviously be monitored regularly.
- Black Tern (*Chlidonias niger*). The Black Tern has been Blue Listed since 1978, primarily because of problems in the eastern part of its breeding range (Tate 1981). Weber (1980) considered it of special concern in British Columbia, where marsh drainage threatens it. In Alberta, it is widespread and its shallow marsh habitat is common (Salt and Salt 1976), but like all marsh birds, marsh drainage poses a potential problem.
- Ancient Murrelet (*Synthliboramphus antiquus*). Alberta's only alcid is on our check list because of one accidental occurrence (Salt and Salt 1976). It was on the Blue List from 1973 to 1976 inclusive on the basis of questionable data (Tate 1981), and it is classed as of special concern in British Columbia (Weber 1980).
- Yellow-billed Cuckoo (*Coccyzus americanus*). This is another accidental species in Alberta (Salt and Salt 1976). Although cyclical in much of its range, it has been on the Blue List since 1972 because of long-term declines in some areas (Tate 1981).
- Black-billed Cuckoo (*Coccyzus erythrophthalmus*). This cuckoo was listed on the Blue List in 1979, but dropped because of its widely fluctuating populations (Tate 1981). In Alberta, it is considered scarce and local with poorly known populations (Ebel and Spalding 1975; Salt and Salt 1976). A detailed assessment of its range and populations in Alberta is warranted.
- Screech Owl (*Otus asio*). This small owl is very rare in Alberta (Salt and Salt 1976), but is included on the EBSG list. It was added to the Blue List in 1981 because of widely scattered declines. Fyfe (1977) considered its populations stable with low to medium abundance in Canada.
- Pygmy Owl (*Glaucidium gnoma*). This tiny owl occurs in Alberta as a peripheral montane species (Ebel and Spalding 1975; Salt and Salt 1976), and although possibly fairly common in some areas, its status is poorly known (Salt and Salt 1976). Fyfe (1977) considered it low to medium in abundance in Canada, with stable populations.
- Burrowing Owl (*Athene cunicularia*). The Burrowing Owl has been on the Blue List since 1972, but is not widely supported for this status at present (Tate 1981). In Canada it is considered threatened by COSEWIC (n.d.) and the status report for that committee by Wedgwood (1979) is by far the most thorough and comprehensive to date. This species is a bird of open prairies and uses the burrows of rodents for nesting. Human interference and agricultural practices can be detrimental to it (Ebel and Spalding 1975; Wedgwood 1979). Lang and Weseloh (1973) and Lang et al. (1978) documented nesting localities in Alberta, and these have been updated by Wedgwood (1979). All the sites mapped by Wedgwood (1979) should be checked on a regular basis, and landowners are encouraged to protect this owl. Fyfe (1976a, 1977) noted that its populations on the prairies are stable outside of Manitoba, and of low to high numbers, with low toxic chemical levels. Weber (1980) classified its British Columbia status as endangered.
- Barred Owl (*Strix varia*). This large owl is a scarce breeder in central western Alberta, whose status is poorly known (Ebel and Spalding 1975; Salt and Salt 1976). Fyfe (1977) considered its populations in Canada as a whole as of medium abundance and stable, but Fyfe (1976a) of low abundance in the prairie provinces, where population trends are unknown.
- Great Gray Owl (*Strix nebulosa*). This large, heavily-feathered owl is classed as rare in Canada by COSEWIC (n.d.), and Ebel and Spalding (1975) considered that it is threatened in Alberta by indiscriminate hunters. Fyfe (1976a, 1977) characterized its populations as fluctuating and rare to medium in numbers. The studies of Nero (1979, 1980) have shown that although this is a rare bird, it is locally fairly common in suitable boreal forest, and is thus not in any immediate danger.
- Long-eared Owl (*Asio otus*). The Long-eared Owl was on the Blue List in 1980, but removed in 1981, as most respondents felt it was still in good numbers (Tate 1981). The EBSG has listed it for Alberta, where it is widespread but poorly known (Salt

- and Salt 1976). Fyfe (1976a, 1977) considered its populations as fluctuating with low to medium numbers and low toxic chemical residue levels.
- Short-eared Owl (*Asio flammeus*). The Blue List has included this prairie owl since 1976 because of problems in various parts of its range, although some areas retain high populations (Tate 1981). Fyfe (1976a, 1977) lists its numbers as low to high with fluctuating populations and its toxic chemical residue levels as low.
- Boreal Owl (*Aegolius funereus*). Ebel and Spalding (1975) listed this tiny owl on their vulnerable list for Alberta on the basis of lack of knowledge on status and population size in its rather extensive provincial range (see Salt and Salt 1976). Fyfe (1976a, 1977) considered its numbers as low and populations as fluctuating.
- Poor-Will (*Phalaenoptilus nuttallii*). Stepney (1981) listed this secretive night bird as accidental in Alberta, but most observers regard it as a regular but rare breeder in the Cypress Hills (Salt and Salt 1976). In 1971, an individual was found in a semi-torpor condition at Lindbergh, near St. Paul, and it was kept indoors all winter, where several of us were able to study it (Boag 1972; Goulden 1972). This may have been an accidental occurrence, but suggests a possibly wider distribution in the province than is currently known.
- Common Nighthawk (*Chordeiles minor*). The "mosquito hawk" was on the Blue List from 1975 to 1977 inclusive, removed for one year, and reinstated from 1979 to present, with serious declines in several areas (Tate 1981). Thus, I concur with EBSG in listing it for Alberta, where its current status should be investigated in detail.
- Black Swift (*Cypseloides niger*). This large swift is known to nest in Alberta only at Johnston's Canyon in Banff National Park (Kondla 1973; Salt and Salt 1976), although a few other localities are suspected (Salt and Salt 1976). Ebel and Spalding (1975) commented that little information is available on its breeding distribution in the province.
- Ruby-throated Hummingbird (*Archilochus colubris*). This hummingbird has been on the Blue List since 1978, with serious declines in parts of its range and healthy populations elsewhere (Tate 1981). It is widespread in the prairie and parkland areas of Alberta (Salt and Salt 1976).
- Calliope Hummingbird (*Stellula calliope*). The Calliope Hummingbird is a scarce breeder in the mountains of Alberta at least as far north as Jasper (Salt and Salt 1976). Ebel and Spalding (1975) considered its status unknown, although several nesting localities have been documented (Salt and Salt 1976; Brunton et al. 1979). At any rate, it should be considered peripheral in the province.
- Common (Red-shafted) Flicker (*Colaptes auratus cafer*). The Red-shafted race of the flicker was on the Blue List in 1972 only, and there is little concern for it at present (Tate 1981). The Common Flicker (race not specified) did show declines on the breeding bird surveys within the southern prairie provinces in 1979, but no obvious changes in 1980 (Silieff and Finney 1981).
- Pileated Woodpecker (*Dryocopus pileatus*). The EBSG list includes this large woodpecker. Its range in Alberta is extensive (Salt and Salt 1976), but its populations have not been assessed in detail.
- Red-headed Woodpecker (*Melanerpes erythrocephalus*). This colourful woodpecker has been on the Blue List since 1976, with habitat loss causing severe declines in some areas (Tate 1981). Although there are several records for Alberta, it is presently only casual, and there are no definite breeding records to date (Salt and Salt 1976).
- Lewis's Woodpecker (*Asyndesmus lewis*). This striking multi-hued woodpecker is in Canada essentially a bird of interior British Columbia which breeds irregularly and uncommonly in the mountains of southwestern Alberta (Salt and Salt 1976; Weber 1980). Its population size and distribution in the province are not well known (Ebel and Spalding 1975). It has been on the Blue List since 1975, with competition from Starlings (*Sturnus vulgaris*) considered the most important factor in its decline (Tate 1981). In British Columbia, it has disappeared from former coastal breeding areas, with the timing of the disappearance closely coinciding with Starling establishment (Weber 1980). Weber (1980) considered it still common in the southern interior of B.C., but classed it as of special concern as even there it faces Starling

competition problems.

- Hairy Woodpecker (*Picoides villosus*). Operators of winter bird feeders will no doubt wonder at the listing of this species which is widespread in Alberta (Salt and Salt 1976). However, it has been on the Blue List since 1975 because of serious declines in parts of its range (Tate 1981). Although increasing or stable in much of its range (Tate 1981), declines elsewhere suggest that observers in Alberta should be alert to possible trouble here.
- Black-backed Three-toed Woodpecker (*Picoides arcticus*). This species was included on the Alberta vulnerable list by Ebel and Spalding (1975) because of lack of knowledge of its distribution in the province. Salt and Salt (1976) mapped an extensive area of occurrence in Alberta, but commented that it is "common nowhere" in this range.
- Scissor-tailed Flycatcher (*Muscivora forficata*). This striking flycatcher is an accidental species, with three records in Alberta (Salt and Salt 1976). It was on the Blue List in 1972 only.
- Great Crested Flycatcher (*Myiarchus crinitus*). The EBSG listed this noisy species on its Alberta risk list, presumably because of its limited breeding in the province. Until recently, it was considered accidental in Alberta, but there have been several records in recent years (summarized by Weber 1974; Salt and Salt 1976), and has been established to nest at least rarely (Trann 1977).
- Eastern Phoebe (*Sayornis phoebe*). This common flycatcher was placed on the Blue List in 1980, but removed in 1981 when declines in most areas were replaced by normal levels (Tate 1981).
- Yellow-bellied Flycatcher (*Empidonax flaviventris*). Ebel and Spalding (1975) noted that population size and breeding limits of this flycatcher are poorly known in Alberta. Its breeding habitat is the muskeg country of northern Alberta, where it is probably widespread (Salt and Salt 1976).
- Willow Flycatcher (*Empidonax traillii*). This close relative of the Alder Flycatcher (*E. alnorum*) has been on the Blue List since 1980 because of declines and disappearance in western parts of its range (Tate 1981). Although said to be doing well elsewhere (Tate 1981), its range in Alberta should be disentangled from that of the Alder (Salt and Salt 1976), so that status of both can be determined.
- Least Flycatcher (*Empidonax minimus*). This flycatcher is widely distributed in Alberta (Salt and Salt 1976), and I have heard of no problems for it in the province. However, it was on the Blue List in 1980, then removed in 1981 as numbers returned to normal in all but two widely separated areas (Tate 1981). Thus, this is a common species with little immediate concern, but whose numbers should be watched.
- Western Flycatcher (*Empidonax difficilis*). Ebel and Spalding (1975) included this species on their list of vulnerable species in Alberta because of lack of information on populations and breeding range. It occurs only in a small area of mountains in the southwest (Salt and Salt 1976), and thus should at least be listed as peripheral in Alberta.
- Rough-winged Swallow (*Stelgidopteryx ruficollis*). The EBSG included this brown swallow on their proposed list for Alberta. This species showed a decline in the southern prairie province breeding bird surveys in 1980 (Silieff and Finney 1981), but its similarity to the more common Bank Swallow (*Riparia riparia*), its non-colonial nature, and its frequent association with flocks of Bank Swallows all contribute to its being frequently overlooked (Salt and Salt 1976; Silieff and Finney 1981), and Salt and Salt (1976) considered it "not uncommon" at various localities in southern Alberta.
- Cliff Swallow (*Petrochelidon pyrrhonota*). The Cliff Swallow was on the Blue List in 1976 and 1977, then removed, but reinstated in 1981, with House Sparrow (*Passer domesticus*) usurpation of nests and painting of vertical surfaces to which it glues its nests cited as important causes of decline (Tate 1981). Lang (1974) censused its populations in Calgary, documenting its numbers of various bridges, but I am not aware of any other detailed census in Alberta.
- Purple Martin (*Progne subis*). This large, colonial swallow has been on the Blue List

- since 1975, with serious declines in parts of its range (Tate 1981). In Alberta, this species is at its northern breeding limit (Finlay 1971). It adapts well to nest boxes provided for it, and may be increasing in at least parts of the province (Bird and Bird 1971). Problems include competition for nest sites with Starlings and House Sparrows, and poor management of boxes (Tate 1981), and I agree with its listing for Alberta by EBSG, as its numbers should be monitored carefully. Weber (1980) also considered it as of special concern in B.C.
- White-breasted Nuthatch (*Sitta carolinensis*). Ebel and Spalding (1975) listed this newcomer to Alberta on their vulnerable list on the basis of lack of knowledge of its populations. However, it appears to be increasing in central Alberta (Salt and Salt 1976).
- Brown Creeper (*Certhia familiaris*). Ebel and Spalding (1975) included this holarctic passerine on their vulnerable list because knowledge of its status is scant. Salt and Salt (1976) attributed the paucity of nesting data to its inconspicuousness.
- American Dipper (*Cinclus mexicanus*). This distinctive passerine is confined to fast water streams of the mountains and is thus peripheral as a breeding species in Alberta (Salt and Salt 1976). Thus, EBSG has included it on their proposed risk list. The census sites of O'Keefe (1974) should be revisited and his study extended to other areas.
- House Wren (*Troglodytes aedon*). This widespread little bird was included on the Blue List in 1972, but problems since then appear to be localized (Tate 1981). There was a significant increase in this species in breeding bird surveys in the southern prairie provinces in 1979 (Finney et al. 1980).
- Winter Wren (*Troglodytes troglodytes*). This holarctic wren is a boreal forest and mountain bird in Alberta, where it is widespread and common (Salt and Salt 1976), but was listed on Ebel and Spalding's (1975) vulnerable list because of little information on current status and populations. It was also included on the Blue List in 1980, but removed in 1981 when it recovered in several areas (Tate 1981).
- Short-billed Marsh Wren (*Cistothorus platensis*). This wren of sedge meadows was added to the Blue List in 1979, removed in 1980, and reinstated in 1981, with reduced populations in several areas, attributed at least in part to farming practices (Tate 1981). In Alberta, it is very localized with scattered observations (Weber 1974; Salt and Salt 1976; Nordstrom 1978). The definite and probable nesting sites summarized and mapped by Nordstrom (1978) should be checked regularly.
- Northern Mockingbird (*Mimus polyglottos*). This famous mimic is a casual breeding in Alberta, with three known nesting sites and one suspected (Salt and Salt 1976). Several additional observations have been made (Ebel and Spalding 1975; Salt and Salt 1976).
- Eastern Bluebird (*Sialia sialis*). The Eastern Bluebird was placed on the Blue List in 1972, then removed, but reinstated from 1978 until the present (Tate 1981). In Alberta, it has only recently been documented as an accidental (Butot 1978; Salt 1978), although there were earlier unconfirmed reports (e.g. Clappison 1965).
- Mountain Bluebird (*Sialia currucoides*). Alberta's common bluebird was on the Blue List in 1972 and from 1975 to 1977, and although not included in 1981, Tate (1981) predicted that problems may be more widespread than present information indicated. Weber (1980) classed it as of special concern in B.C. In Alberta, there are several lines of nest boxes designed to help this species, and the many studies of Edgar T. Jones, Harold Pinel, Ken Trann and others are too numerous to cite here. Three summaries of efforts in the province are those of Stiles (1979), Finlay (1980) and Chalmers (1981).
- Golden-crowned Kinglet (*Regulus satrapa*). This tiny bird has been on the Blue List since 1980, with declines in several areas, but is considered "a candidate for early removal from the list" (Tate 1981).
- Ruby-crowned Kinglet (*Regulus calendula*). Our other kinglet is widespread in Alberta (Salt and Salt 1976). It was placed on the Blue List in 1980, but removed in 1981 after making a good comeback from its temporary decline (Tate 1981).
- Sprague's Pipit (*Anthus spragueii*). This prairie bird was included on the EBSG list.

Its range is quite extensive in Alberta, but it is "locally distributed" within this area (Salt and Salt 1976), and is susceptible to changing agricultural practices.

Northern Shrike (*Lanius excubitor*). The EBSG included this shrike on its list, presumably because of its peripheral breeding status in extreme northeastern Alberta (Salt and Salt 1976).

Loggerhead Shrike (*Lanius ludovicianus*). The Loggerhead Shrike has been on the Blue List since 1972, with "all reporting regions" noting declines, one as much as 70 per cent in 10 years (Tate 1981). Clearly, its numbers in Alberta should be monitored, as suggested by the EBSG proposed listing.

Warbling Vireo (*Vireo gilvus*). This common Alberta species was on the Blue List from 1978 to 1980 inclusive, but removed in 1981 (Tate 1981). Finney et al. (1980) reported significant increases in the southern prairie provinces on breeding bird surveys in 1979, but it declined on the same surveys in 1980 (Silieff and Finney 1981).

Nashville Warbler (*Oporornis ruficapilla*). As recently as 1973, this species was considered only hypothetical in Alberta (Salt 1973), but substantiating evidence was obtained at both Banff and Edmonton in 1974 (Salt and Salt 1976). It was included on the EBSG list, presumably because of a possible (but suspect) nesting in the Cypress Hills (Salt and Salt 1976) or numbers observed at Cold Lake during a FAN field trip. A positive nest record was obtained at Link Creek, about 50 km southwest of Calgary in 1980 (M.R. Lein and G.M. Wagner, submitted Ms.).

Yellow Warbler (*Dendroica petechia*). This species is so common and widespread in Alberta (Salt 1973) that its inclusion here will no doubt raise a few eyebrows. However, it has been on the Blue List since 1973 in spite of a "cacophony of objection" because of serious declines in several areas, with Brown-headed Cowbird (*Molothrus ater*) egg parasitism a frequently-mentioned cause (Tate 1981). This is another example of a common species that needs watching.

Townsend's Warbler (*Dendroica townsendi*). Ebel and Spalding (1975) listed this species as vulnerable in Alberta because of lack of nesting evidence. It is confined in its Alberta range to the mountains (Salt 1973), and can thus be considered peripheral.

Blackburnian Warbler (*Dendroica fusca*). This colourful warbler has been sighted in several places in Alberta, and possibly breeds, but this has not yet been proven (Salt 1973; Ebel and Spalding 1975; Nordstrom 1978). Thus, it may be considered peripheral in the province. Nordstrom (1978) provided the most recent review of Alberta records.

Chestnut-sided Warbler (*Dendroica pensylvanica*). This is another warbler with several records in the province that probably breeds in Alberta, but with no definitive nesting evidence acquired to date (Salt 1973; Ebel and Spalding 1975; Nordstrom 1978). The records, summarized most recently by Nordstrom (1978), suggest peripheral nesting status in the province.

Pine Warbler (*Dendroica pinus*). Ebel and Spalding (1975) listed this species as vulnerable in Alberta on the basis of poorly known distribution and possible breeding. There are few Alberta records to date (Salt 1973).

Common Yellowthroat (*Geothlypis trichas*). This common marshland bird was on the Blue List in 1973 and 1974 (Tate 1981). I doubt that it is in trouble in Alberta but, like all marsh birds, it is susceptible to habitat loss.

Yellow-breasted Chat (*Icteria virens*). This large warbler was on the Blue List from 1976 to 1981, but has been removed at present (Tate 1981). Its distribution in Alberta is not well known (Ebel and Spalding 1975), but as it is confined primarily to three river valleys (Salt 1973), it should be considered a peripheral breeder.

Canada Warbler (*Wilsonia canadensis*). The Canada Warbler was listed as vulnerable in Alberta by Ebel and Spalding (1975) because of its "limited range" in Alberta and lack of proof of nesting. In fact, its range as mapped by Salt (1973) is quite extensive, but in the little worked northeastern part of the province.

Bobolink (*Dolichonyx oryzivorus*). This is the only icterid on the list proposed by EBSG. Its occurrence in Alberta is relatively recent and irregular (Salt and Salt 1976).

- Northern (Bullock's) Oriole (*Icterus galbula bullocki*). Ebel and Spalding (1975) justifiably included this distinct race on their list of vulnerable Alberta birds as a peripheral breeder. Its range in the province is primarily confined to the same three valleys as the chat (Salt and Salt 1976).
- Black-headed Grosbeak (*Pheucticus melanocephalus*). Ebel and Spalding (1975) commented that the range in Alberta of this species has been reduced. Its breeding locations in the province are relatively few (Salt and Salt 1976) and it is best regarded as peripheral at present.
- Lazuli Bunting (*Passerina amoena*). Ebel and Spalding (1975) included this species as vulnerable in Alberta because of poor knowledge of its mountain and foothills breeding range. It is confined to southern parts of the province (Salt and Salt 1976), and seems little more than peripheral.
- Dickcissel (*Spiza americana*). This meadowlark-like finch has been on the Blue List since 1978, with declines in much of its range (Tate 1981). To date it is only accidental in Alberta (Salt and Salt 1976).
- Cassin's Finch (*Carpodacus cassinii*). This species breeds in Waterton Lakes National Park, and possibly elsewhere (Ebel and Spalding 1975; Salt and Salt 1976). Since its known breeding range in Alberta is restricted, it is best regarded as peripheral.
- House Finch (*Carpodacus mexicanus*). The EBSG list included this colourful finch which at present is regarded as a rare vagrant in Alberta (Salt and Salt 1976).
- Rufous-sided Towhee (*Pipilo erythrophthalmus*). The EBSG lists this species, of which the western spotted race occurs in Alberta. Its range in Alberta is confined to the southeast and central-east (Salt and Salt 1976), but they do not seem very common in most of this range.
- Lark Bunting (*Calamospiza melanocorys*). The EBSG also lists this distinctive black and white finch. Its range in southeastern Alberta is slightly more confined than that of the towhee (Salt and Salt 1976), and it is an erratic breeder wherever it occurs.
- Grasshopper Sparrow (*Ammodramus savannarum*). This little known sparrow is another species confined primarily to the grasslands of southeastern Alberta (Salt and Salt 1976), and therefore peripheral in the province. Ebel and Spalding (1975) commented that it "may nest" in limited areas, and Salt and Salt (1976) mentioned several areas where it is actually known to nest. In at least one of these areas, they nest almost colonially (N.G. Kondla, pers. comm.). This species has been on the Blue List since 1974, because of widespread declines (Tate 1981), and is also classed as threatened in British Columbia (Weber 1980).
- Baird's Sparrow (*Ammodramus bairdii*). The EBSG list also includes this grassland sparrow, which occurs "very locally" in southeastern Alberta (Salt and Salt 1976). In 1981, while conducting two breeding bird surveys in the Coronation area, I found them fairly common there.
- LeConte's Sparrow (*Ammodramus leconteii*). This is another grassland species, much more widespread in Alberta than either the Grasshopper or Baird's Sparrows (Salt and Salt 1976).
- Sharp-tailed Sparrow (*Ammodramus caudacuta*). This marshland sparrow breeds in a wide belt through the northern half of Alberta, but only locally (Salt and Salt 1976). The EBSG has suggested listing it as at risk in Alberta.
- Vesper Sparrow (*Poocetes gramineus*). This common bird was on the Blue List from 1978 to 1980 inclusive, but delisted in 1981 (Tate 1981). Salt and Salt (1976) called it "the most common" of the sparrows in Alberta, and my observations in various parts of southern and central Alberta in 1980 and 1981 certainly suggested no decline recently.
- Lark Sparrow (*Chondestes grammacus*). This is another prairie sparrow listed by EBSG. It is restricted primarily to southeastern Alberta and even there is localized (Salt and Salt 1976).
- Brewer's Sparrow (*Spizella breweri*). This sparrow occurs in two distinct populations, one on the prairies and one in the mountains, with neither particularly common (Salt and Salt 1976). It is included on the EBSG list.

- Golden-crowned Sparrow (*Zonotrichia atricapilla*). This large sparrow is also listed by EBSG. It is a mountain breeding species with few documented locations of nesting in Alberta (Salt and Salt 1976).
- Fox Sparrow (*Passerella iliaca*). The Fox Sparrow was on the Blue List in 1972 only (Tate 1981). It is common and widespread in montane and northern parts of Alberta (Salt and Salt 1976).
- Swamp Sparrow (*Melospiza georgiana*). This is another sparrow included on the EBSG list. It is widespread in northern and central Alberta, but breeds only locally (Salt and Salt 1976).
- McCown's Longspur (*Calcarius mccownii*). This is another grassland fringillid included on the EBSG list. It is found in the prairies of the southeastern part of the province, but is uncommon and locally distributed (Salt and Salt 1976).

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OVERHEARD . . .

"I have seen a thousand rotting buffalos on the prairie, left by the white man who shot them from a passing train. I am a savage and I do not understand how the smoking iron horse can be more important than the buffalo that we kill only to stay alive.

What is man without the beasts? If all the beasts were gone, men would die from a great loneliness of spirit. For whatever happens to the beasts soon happens to man. All things are connected."

Submitted by Murray A. Tozer,
from 1854 speech by Chief Seattle
of the Duwamish League

ALBERTA MAMMALS

by Hugh C. Smith
Provincial Museum of Alberta
12845 - 102 Ave., Edmonton, Alberta T5N 0M6

"I am not really excited about compiling such lists as I think they frequently convey information that may be misleading. I do not believe any of our mammals are threatened or endangered and any that are 'rare' are so because they are at the limit of their geographic range. In many cases our knowledge of the populations of the various species is so scanty as to be almost useless and to make any statement on the status of a species on this basis is leaving a person open to much criticism. . ."]

SPECIES LIST

INSECTIVORA (SHREWS)

No shrews are considered threatened or endangered.

CHIROPTERA (BATS)

Our knowledge of bats is not sufficient to make a definitive statement regarding their status. However, none seem to warrant any designation as being threatened or endangered.

The Red Bat is considered as an accidental as there are only four records of its occurrence in the province.

RODENTIA (RODENTS)

Red-tailed Chipmunk - Limited distribution in the province, not in danger, habitat seems secure.

Western Harvest Mouse - Limited distribution, at extreme limit of its range, habitat seems secure.

Yellow-cheeked Vole - Status not known, may no longer occur in province, not due to human interference, but habitat seems secure.

Prairie Vole - Status not known, at limit of its range, habitat seems secure.

CARNIVORA (CARNIVORES)

Wolf - Not in any danger in the province; however, in some areas populations are in low numbers.

Swift Fox - Does not occur in the province at this time. Considered extinct in the province.

Grizzly Bear - Population not known, ranges widely from protected areas, is subject to control measures, is actively managed, habitat being monitored.

Black-footed Ferret - Does not occur in province at this time. Considered extinct in Alberta.

Cougar - Status not known, population stable but small, probably not in any danger.

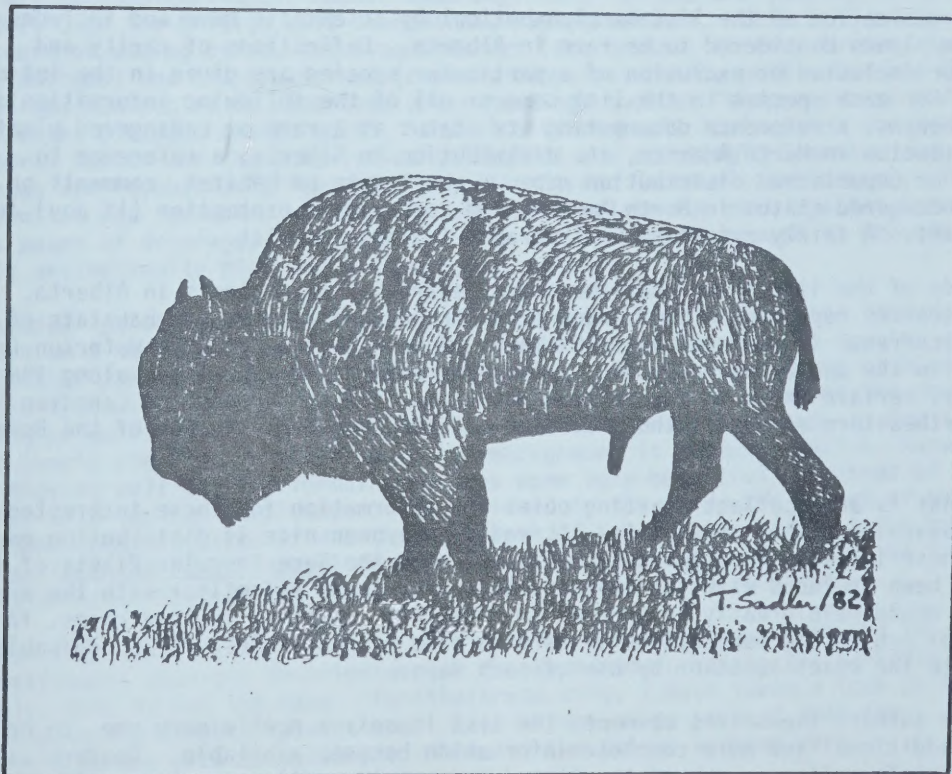
ARTIODACTYLA (DEER, SHEEP, GOATS, BISON)

Caribou - Status unknown, population small and distributed over wide area. Some subspecies of caribou may be in some danger, for example, mountain caribou.

Mountain Goat - Status not critical, requires monitoring, habitat not in danger.

Bighorn Sheep - Population subject to wide fluctuations. Population presently stable and not in danger. Requires monitoring.

Bison - Bison are not in danger. However, the subspecies wood bison (*Bison bison athabasca*) may no longer exist in the province. The populations of bison are being closely monitored.



NATURALISTS' BOOKSHELF

THE RARE VASCULAR PLANTS OF ALBERTA

by G.W. Argus and D.J. White. 1978. Syllogeus No. 17, National Museum of Natural Sciences, Ottawa. 47 pp.

This publication from the National Museums of Canada is one of a series of seven currently available on the rare vascular plants of Canada. The others cover Manitoba, Saskatchewan, Ontario, Nova Scotia, the Northwest Territories and, the most recent, the Yukon. (These lists are available free of charge from the National Museum of Natural Sciences in Ottawa, K1A 0M8). The National Museum has been compiling lists of the rare vascular plants of Canada since 1975. The intent of the series is to provide scientific information on the rare and endangered plants of Canada so that appropriate conservation measures may be taken to protect them and their habitats. One of the main uses of the lists can be as a source of candidate rare species to be evaluated by government agencies. Alberta is one of the minority of provinces which currently does not have specific endangered species legislation, although there are a number of Provincial Acts which serve to protect rare and endangered species indirectly through habitat protection.

The organization of the list is alphabetical by scientific name and includes all native plants considered to be rare in Alberta. Definitions of rarity and reasons for inclusion or exclusion of a particular species are given in the introduction. For each species in the list some or all of the following information is given: synonyms, a reference documenting its status as a rare or endangered plant, its distribution in North America, its distribution in Alberta, a reference to published or unpublished distribution maps, a short note on habitat, comments on its rare or endangered status in North America and legislative protection (if any) accorded to the plant. A fairly extensive Bibliography follows the list.

A study of the list shows that there are centres of rare plants in Alberta. Many of these centres represent either edges of distributional ranges, or habitats of limited occurrence in the province. Examples of such centres are the Waterton-Crownsnest area in the southwestern corner of the province, the dry prairies along the southern border, certain areas in the western mountains, the sand dunes and Canadian Shield in the northeastern corner of the province, and the Swan Hills region of the Boreal Forest.

The list is an excellent starting point for information for those interested in the rare vascular plants of Alberta. It would have been nice if distribution maps such as those included in the recent publication on the Rare Vascular Plants of the Yukon had been included with the Alberta list. For those unfamiliar with the area, such maps would help greatly in general orientation. However, in some cases, in the interest of protecting populations of certain rare plant species, it is advisable not to indicate the exact location by use of such maps.

As the authors themselves comment, the list is only a preliminary one, to be revised as additional and more complete information becomes available. Readers with additional information on any of the listed (or not listed!) rare plants are encouraged to send it to the National Museum in Ottawa.

I am given to understand that funding for the rare plants project has been termi—

nated. It will indeed be a shame if the National Museum is unable to complete its original intention of producing lists of rare plants for all the provinces and territories of Canada. A complete set of such lists would form a sound foundation on which to base a rational approach to the preservation of rare and endangered species and their habitats throughout the entire country.

- J. Derek Johnson, Northern Forest Research
Centre, 5320 - 122 St., Edmonton, AB T6H 3S5

THE WADING BIRDS OF NORTH AMERICA (NORTH OF MEXICO)

by Karl E. Karalus and Allen W. Eckert. 1981. Doubleday Canada Ltd., Toronto.
252 pp. \$63.00

This book is the second collaboration between artist Karl E. Karalus and writer Allen W. Eckert, their first being The Owls of North America. The format followed is similar in each of the books. The Wading Birds of North America is a hybrid between the albeit beautiful but technically weak coffee table book, and the serious scientific work. In the first respect, it is quite successful and I would certainly not be ashamed to place it on my coffee table. In the second respect, however, I would advise you to delve deeper into your library for a more reliable source of scientific information.

The Wading Birds of North America covers a rather disparate group of birds whose affinities are perhaps ecological rather than physical. If you are looking for a book on "the waders", as the British call shorebirds, look elsewhere. This book covers only two Orders of wading birds, the Ciconiiformes (the herons, storks, ibises, spoon-bills and flamingos) and the Gruiformes (cranes, limpkins, rails, gallinules and coots). Each species and subspecies is described under headings such as "shape at rest and in flight"; "crests, plumage, annual molt"; "sexual differences"; "coloration and markings"; "general habits and characteristics"; "habitat and roosting"; "enemies and defenses"; "eggs and incubation"; "young"; "migration"; and "economic influence". There is a distribution map for each, and a full page colour plate for each species as well as numerous pages of drawings. The type is large and items well-spaced to provide a book that is aesthetically pleasing and very easy to use.

Karl Karalus' paintings usually consist of a bird or birds with little foreground detail placed on a monochrome background. This technique works well for species with intricate feather patterning such as owls, but not as well with this group of birds. Many of these species have a basic monochrome coloration to start with, so the result is a painting primarily in two colours. The overall effect in many cases is too simplistic and not overly pleasing, especially if the background is somewhat garish. Karalus handles feathering well and the formula produces some very beautiful paintings of those species with variegated plumages. When viewed in the wild, the impact of many of these rather ungainly birds is due to the splash of solid colour against the background. They lack the "cute" appeal of owls and as such do not lend themselves so well to this artistic style, even though these are excellent illustrations.

The cover flap advertising refers to this book as a "definitive work" and to "full scientifically accurate descriptions of the appearance, habits and habitats". Unfortunately, this is not the case. To illustrate this, I have taken a look at this book as it applies to Alberta species and I have no reason to suspect that the accuracy should be any greater elsewhere. Some of the things I found were:

Black-crowned Night Heron - The distribution map for this species does not include Alberta within the range although the species has been a regular member of the Alberta avifauna since 1958 with numerous breeding colonies established. Ironically, the

author cites two scientific papers by James W. Woolford and David A. Boag on the ecology of this species in Alberta in his bibliography! In his introduction the author states that "In a book of this scope, it was important to include all known aspects of the life histories of each of the species. . .". It may come as a surprise to Albertans, then, that Black-crowned Night Herons construct nests in "the sturdier branches of low trees", period. Do not however think that you have made a major new discovery when you find that almost all Black-crowned Night Herons in the plains region construct overwater nests like bitterns. This was reported as early as 1926 in A.C. Bent's classic "Life Histories" series which includes photos of such nests and is reiterated in the definitive work to date on North American herons, Volume One of Ralph S. Palmer's Handbook of North American Birds.

Snowy Egret - The range map for Brewster's egret, the western subspecies, includes southern Alberta and southwestern Saskatchewan but excludes areas of the western US where colonies are known to occur. No subspecific determination has as yet been made on any of the few Snowy Egrets that have strayed to Alberta, although they may be Brewster's Egrets.

Eastern Least Bittern - The distribution map for this subspecies of the Least Bittern includes the southern part of western Canada and all of the western US. The range of this subspecies in actuality extends west only to the eastern edge of the Great Plains. It is replaced in the western US by the western subspecies. Although there is one B.C. record of a Least Bittern and a couple of Saskatchewan records, the only nesting record from western Canada that I am aware of was at Delta, Manitoba.

Sandhill Crane - While the errors pointed out up to this point may not be overly significant, the Sandhill Crane account is muddled and makes me seriously question the care taken in assembling the text. Although the author cites one of Lawrence H. Walkinshaw's books, The Sandhill Cranes, in his bibliography, he has not made good use of Dr. Walkinshaw's knowledge. This account refers to Grus canadensis canadensis as the Sandhill Crane and shows its range as extending from arctic Alaska to Florida. This race is actually the Little Brown or Lesser Sandhill Crane which nests in the arctic and subarctic regions. G. c. tabida which the author calls the "little brown crane" and shows as occurring across southern B.C., Alberta, and Saskatchewan and throughout the western US, is in actuality the Greater Sandhill Crane, the largest race. This is further confused in the text because the author refers to the Little Brown Crane as nesting across northern Alaska and Canada, the correct range of G.c. canadensis, and not where he shows the range on his map. Eckert then refers to the Florida Sandhill Crane as being smaller than the Little Brown, but larger than the Sandhill Crane. It is indeed smaller than G. c. tabida, which is in reality the Greater Sandhill Crane, but is larger than the Little Brown Crane, G. c. canadensis. No mention is made of G. c. rowani which name has been suggested to describe the intermediate sized cranes which nest in northcentral Alberta. These may or may not constitute a valid subspecies.

Although this book does contain a great deal of information arranged in an attractive and easily-accessible manner, it is not a "definitive work". It is, rather, a flawed gem to be purchased by the lover of fine books. I cannot recommend it to those who seek to further their scientific knowledge of these birds. They had best resort to more dependable works.

- Tom Sadler, Ducks Unlimited Canada,
Box 134, Tofield, AB T0B 4J0

ARCTIC OIL

by John A. Livingston. 1981. Hardback; 160 pp + colour and 30 b/w photos and illustrations. Published by CBC Merchandising.

People see the arctic in different ways. To some it is a barren desert, mostly devoid of life. To others it is an extremely fragile ecosystem which could be irreversibly changed by industrial development. John Livingston challenges perceptions and assumptions about the arctic in his book, Arctic Oil, a spin-off from the CBC television program of the same name.

Part One, almost one-half of the book, considers the natural history of the arctic, focussing on two biological cases, the Yukon North Slope and Lancaster Sound. Livingston describes "coping" by plants, animals and native people to show that wildlife lives a tenuous but balanced existence, influenced by the harsh environmental conditions of the north. Arctic animals may not be able to cope with any sudden changes, such as those provided by industrial man.

Livingston uses examples to give some idea of the life processes in the arctic. "An often and uncritically repeated definition of the arctic hinges on the absence of trees, which simply isn't accurate. Much of the tundra is covered with trees -- willows, for example -- but instead of boasting the great sturdy trunks and cascading limbs of their southern relatives, arctic willows grow flatly along the ground, pressed against it vinelike, as though clinging with desperation for whatever mercies the land may afford." There is no attempt at comprehensiveness and for the reader who is an arctic biologist, there is nothing new. For the non-biologist, this section is a clear and consistent introduction to the parts which follow.

In Parts Two and Three of Arctic Oil, Livingston looks at the issues and problems that threaten the integrity of the north. He likens the issues to the visible, above-surface part of an iceberg. The problems are like the invisible, sub-surface part -- rarely acknowledged and even more rarely addressed.

The issues in "The Tip of the Iceberg" include the familiar ones of oil spills in arctic ice, socio-economic impacts, the Federal Government's "need to know" policy, native claims, the environmental assessment and review process and the fate of the proposed protected areas. Many of these issues have high profiles as the result of continuous pressure by conservation groups. "The tip of the iceberg is brightly lit and in high relief, for anyone to see who cares to look at it."

The issues are both environmental and political. But, as readers will discover, "the distinction is arbitrary, artificial, and quite without meaning". Take, for example, the federal environmental assessment and review process. The outcome of the process has obvious ecological ramifications but it also reveals important government policies and strategies. The effects of industrial exploration and development are felt not only by wildlife but also by native people.

Part Three, the look at problems, is called "The Rest of the Iceberg". Here the reader may recognize ideas addressed in Livingston's other recent book, The Fallacy of Wildlife Conservation. He explores the historical and cultural roots of the southern Canadian perception of the north. Livingston believes that the root of our problems of perception lies in the drive to develop resources. Industry views northern resources as something created to serve the needs of human society. "There could be no other reason for their presence on the planet. Further, since human consumption is the reason for their existence, they must be consumed. Not to consume them would be to 'waste' them. . ." The sacrifice of Inuit culture, northern plants and animals is

necessary to serve "the higher purpose". This reasoning leads Livingston to conclude that in order to save the arctic, industrial man must be shut out now. The final section, "About Solutions", offers some choices for "saving" the north. It is suggested that industrial activity be halted long enough to take inventory of the "damage already inflicted", and that triage, a system of assigning degrees of urgency, be used to establish which areas should be saved. To protect what remains of the north, industrial man should be fenced in, not nature.

But what is the "realistic" response to industrial pressure in the north? "It may be that there is none -- or at least none that can be accommodated within the development ethic. . . It may be that the answer is to be found in what we want the north country to be like after the due passage of our own time. . . We can find it only in our hearts. Quite simply, the arctic question is a moral and ethical one." The reader is free, of course, not to agree with Livingston's view of the arctic. But it is clear that a large number of individuals and organizations want government to respond to the conservation priorities of Canadians as well as to their energy needs. Livingston's arguments are cogent and compelling. Let the proponents of "conventional wisdom" respond in kind.

- Richard Pratt, Conservation Director,
Canadian Nature Federation

CHECKLIST OF ALBERTA BIRDS

Provincial Museum and Archives of Alberta, 12845 - 102 Avenue, Edmonton, Alta.
T5N 0M6. \$1.00.

With a significant number of new bird species recorded in Alberta over the last few years, a new provincial checklist was certainly needed. An update of the Third Edition is all that was required, optional additions being the inclusion of seasonal status and general abundance notations. What the Provincial Museum has provided, however, is something quite different, and will only serve to raise the ire of serious birders and confuse or misinform the uninitiated.

The species list itself includes a number of species for which there is no concrete evidence of occurrence in Alberta, for example the Black-throated Sparrow and Chimney Swift. These fall under the categories of "published detailed reports" or "two or more sightings", criteria which should qualify records as "hypothetical". If these "new wave" standards are applied to the Barn Owl, a species well-documented from the Cypress Hills, it should also appear on the list proper instead of the hypothetical list. This inconsistency is one of many scattered throughout the publication. "Red-bellied Sapsucker" constitutes an error in nomenclature and should appear as "Red-breasted Sapsucker". Other "readily-identifiable" subspecies could have been included, such as the Red-naped Sapsucker and Mearn's Junco.

In reference to front page information, the introduction is confusing and verbose, and contains a spelling error. In the Status Codes, the differentiation between spring and fall migrants is not useful because of a lack of records from many parts of the province, and an inconsistent application of these categories, for example, numerous species of boreal passerines occurring in the grassland region predominately in the fall are not noted as such. Winter Visitors don't occur only in the winter, and many species which have wintered have been missed. "Status questionable" should have been applied much more frequently, and "species requiring additional data" pertains to just about every species and adds nothing to the checklist. A category for introduced species does not exist but would have been valuable, especially in clarifying the status of certain gallinaceous birds.

The Relative Abundance categories used are purely subjective and the attempt to employ 5 ratings is pointless - a 3-tier system (common, uncommon, rare) would have been more practical. The definitions of the various categories are very poor, and the criteria is variable. It is stated that the abundance codes reflect the occurrence of a species throughout an entire natural region even though the range of the species may be smaller than the natural region. This is simply not true for a number of species, including the Western Wood Pewee and other riverine birds of the grasslands; these species are called fairly common even though riverine habitats are very localized in this region. "Accidental" is misused as an abundance category and should have been put in the status ratings.

An attempt to analyze the species' occurrence in each of five natural regions was a faux pas. This is difficult enough to do in book form and fails miserably in a checklist. At best, this only serves as a poor summary of the last two editions of The Birds of Alberta. If the Provincial Museum wanted to deal with range and ecology it should have produced a supplement to The Birds of Alberta containing information on habitats, rare and local species, management concerns and hypothetical species - information which is badly needed.

In summary, this checklist was very poorly researched. A good deal of accessible published and unpublished information was ignored and the questionable designations on abundance, status and breeding are far too numerous. It is apparent that the writer(s) attempted to include too much information. As it now stands, Alberta is still in need of a provincial bird list based on acceptable standards. What is really upsetting is the amount of time and taxpayer's money spent on a very unprofessional publication. The final insult, however, is that it sells for \$1 per copy!

- Cleve Wershler, 430-15403 Deer Run Dr. SE.,
Calgary, AB T2J 6B8

THE DOOMSDAY BOOK OF ANIMALS: A NATURAL HISTORY OF VANISHED SPECIES

by David Day. 1981. Illus. by Tim Bramfitt, Peter Hayman, Mick Loates and Maurice Wilson. 288 pp. \$49.95. John Wiley & Sons Canada Ltd., Rexdale, Ont.

The Doomsday Book of Animals appears, at first glance, to be a lovely, coffee table book. It is fairly well-researched, is well written, and lavishly illustrated with beautiful plates. However, its similarity to other coffee table books ends there. It is perhaps the most depressing book I've ever read. HRH The Duke of Edinburgh, in his foreward, puts it most aptly: "It makes extremely uncomfortable reading but unless a great many people get to know what has happened, what is happening and what is likely to happen in the future in the natural world around us, there will be no chance of preventing further and catastrophic damage".

The author has researched vertebrate species/subspecies which have become extinct during the last three hundred years. Using "the massive archives libraries of the British Museum (Natural History). . . naturalists' notes, ships' logs and native lore . . . as well as scholarly monographs and the many general reference works. . ." he has attempted to provide an overview of each species' life history, juxtapositioned with probable or possible causes of its extinction. As the author puts it, this juxtapositioning, sometimes jarring, is intentional: "The message of this book is: 'These animals are extinct. All this beauty and vitality is lost for ever. We can no longer claim to be ignorant of the reasons for their disappearance. Surely the next century need not witness 100 or 1000 more extinctions before the lesson is learned?'".

In addition to species accounts, the appendix contains a four-page essay on vascular

(based on the IUCN's Red Data Book).

Gathering far-flung and often sparse data on the natural history of now-extinct species alone justifies the publication of The Doomsday Book of Animals. But perhaps this books' most important function is that of arousing people to informed outrage and, with any luck at all, action to stem the tide of extinction.

- Virginia Young, R.R. #1, Busby, Alberta TOG OH0

RECENT PUBLICATIONS ON THE NATURAL HISTORY OF ALBERTA

Compiled by Martin K. McNicholl

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OVERHEARD. . .

The following quotation was taken from a press conference held by Mr. James Watt, U.S. Secretary of the Interior, following a meeting with Hon. John Roberts, Minister of the Dept. of Environment:

"I told the Minister that when I was a young boy in Wyoming, we had terrific winter storms that often killed cattle and sometimes killed people. We called those storms, *Canadian blizzards*. I told the Minister that when his country found some way to control those winter storms, perhaps, we could find some way to control the acid rain."

- taken from "International Wildlife",
May-June 1982

DUCKS UNLIMITED CANADA

- AN ALBERTA PERSPECTIVE

by Tom Sadler
Ducks Unlimited
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It was said that the new Canadian corporation to be formed in 1937 would simply have been called "Ducks" if someone had not pointed out that Canadian corporations were often identified as being "limited". To avoid the stigma of becoming "Ducks, Ltd.", when limiting ducks was the antithesis of what was considered desirable, Unlimited was added to the name and Ducks Unlimited was born.

"Ducks and Men" is the title of a history of Ducks Unlimited Canada published in 1978 to commemorate 40 years of wetland conservation in Canada. This volume was preceded by one year by "A Singleness of Purpose", the history of the American organization, Ducks Unlimited Inc. This purpose was stated as follows: "It is the purpose of D.U., Inc., to raise funds for the preservation, restoration and maintenance of wetland habitat on the North American Continent". To those aims, the words "creation" and "development" should perhaps be added, but it is due to an unswerving adherence to that statement of purpose that Ducks Unlimited has continued to grow and expand until in 1981 they were able to claim a total of 1,949 active projects in Canada. A total of 2,906,521 acres were held under easement agreement or reservation. Developed areas made up 1,746,646 acres and 12,507 shoreline miles of this total. Estimated annual production from Ducks Unlimited Canada's wetland projects is approximately 2.4 million waterfowl.

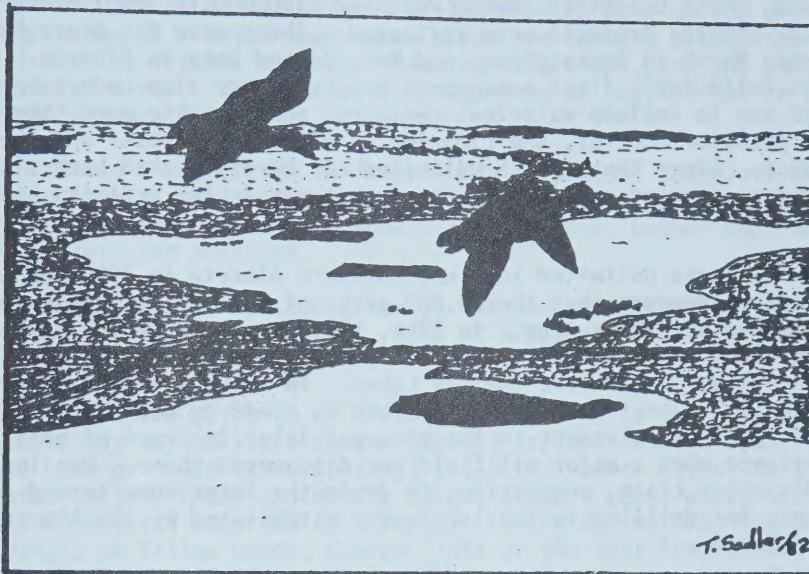
Much of this phenomenal achievement in conservation unequalled by any other similar organization in the world can be attributed to an internal policy perhaps best described as "quiet co-operation" with landowners, other agencies and government. It has been stated that Ducks Unlimited is "willing and anxious to cooperate with any individual and organization subscribing to our objective and willing to aid in solving the many problems facing us". This spirit of cooperation has resulted in Ducks Unlimited gaining the respect of landowner and government alike.

But misconceptions have arisen. Unfortunately it is the nature of our society that confrontation is news and cooperation is overlooked. As a result, much of the success of Ducks Unlimited has been achieved without fanfare or publicity, and is often viewed with an unfounded suspicion of the motivation behind the organization.

HISTORY OF THE ORGANIZATION

Over the years, the methods employed by Ducks Unlimited to achieve their aims have undergone a gradual evolution. The original concept was the result of a drastic decline in waterfowl numbers in the 1930's. Ducks Unlimited is the successful progeny of an organization entitled "The More Game Birds in America Foundation" which came into existence October 6, 1930. The aims of this foundation were:

- an international agency be created to increase waterfowl production;
- funds be raised by a cent-a-shell tax and government appropriations;
- the restoration of waterfowl breeding grounds, preferably by purchase of land in the United States and Canada; and



- management of waterfowl populations by:

1. control of water levels and provisions of an ample supply of food and cover,
2. control of natural enemies where necessary,
3. prevention of fires, stopping unauthorized grazing, and suppression of shooting on the breeding grounds,
4. establishment of refuges for use on northern and southern flights, and
5. concentration areas for winter use.

While some of these aims were to be later passed on to Ducks Unlimited, others ran into immediate difficulties in the United States. The cent-a-shell tax was defeated in Congress. The Foundation then supported the Duck Stamp Law which was passed in 1934. Unfortunately for "More Game Birds", American law prohibits the use of such funds in a foreign country, so the Canadian breeding grounds remained unprotected. The Foundation carried out summer surveys in Canada and aerial surveys were initiated in 1934. The following year "The 1935 International Waterfowl Census" was carried out.

As a result of these surveys, the 1936 annual report of the Foundation suggested the creation of a non-profit Canadian foundation to be supported by money raised by contribution. This foundation would preserve unspoiled northern waterfowl breeding grounds in cooperation with the provincial and federal governments. The restoration of more southern areas would be accomplished by the selection and development of local projects. This plan received immediate approval in Alberta, Saskatchewan and Manitoba, and Ducks Unlimited joined the growing list of organizations to arise out of the dust of the 1930's.

The American parent organization, Ducks Unlimited, Inc., was incorporated on January 29, 1937 and was soon followed by Ducks Unlimited Canada on March 10. While

the governments of Alberta, Saskatchewan and Manitoba agreed to provide Crown Lands free, Ducks Unlimited realized their funding was insufficient for the purchase of private lands. Thus, the policy of obtaining free easements from private landowners evolved. In 1938, Ducks Unlimited Canada received \$100,000 in funding and their first three water control projects were initiated. These were Big Grass Marsh in Manitoba, Waterhen Marsh in Saskatchewan and Many Island Lake in Alberta. In the same year, Ducks Unlimited's first management projects were also undertaken. The management phase was to include waterfowl censuses, photographic work, the prevention of marsh fires, predator control, the cleaning up of disease losses and the prevention of cattle trespass. Since then, Ducks Unlimited has hardly looked back with the creation and preservation of many excellent marsh areas in the prairies and the parklands.

An excursion by Ducks Unlimited into northwestern Alberta in 1953 was to produce significant results. Rumours that the 70,000 acres of shallow marshes known as Hay Lakes were dry turned out to be true. In 1954, through a cost-shared agreement with the Alberta Government under the Water Stabilization Board, Ducks Unlimited constructed a dam on the Amber River to restore the Hay Lakes. In 1960, a second structure was constructed on the Habay section of the Hay Lakes to flood an additional 17,000 acres. Ducks Unlimited's early involvement in the area was later to prove of great but hitherto unforeseen importance when a major oil field was discovered there. Due in part to Ducks Unlimited's prior claim, suggestions to drain the lakes were turned down and rigid requirements for drilling in the lakes were established by the Alberta Oil and Gas Conservation Board.

DUCKS UNLIMITED TODAY

Over the years, Ducks Unlimited Canada has become involved in a number of different activities. At one time, it participated in predator control programs along with the provincial governments and Fish and Game Associations. In subsequent years, as the role of predators in nature became better understood by wildlife biologists, Ducks Unlimited's participation in such control programs diminished. Aerial censuses were conducted up until 1967 and a few breeding pair transects and brood counts are still carried out. Ducks and geese were banded and geese transplanted to establish new breeding populations. Seed and tubers of valuable marsh food plants were harvested and planted in previously unproductive areas. Disease areas were cleaned up. Films, radio broadcasts and publications have been produced for public education programs. Wetland conservation, however, remains the single main drive.

Through an active reconnaissance program, Alberta's wetlands are being systematically evaluated to identify areas with potential for waterfowl production. Additional wetlands referred to us by landowners and government agencies are also looked at each year. Drainage proposals are evaluated to see if there is any manner in which we can become involved to preserve the more valuable wetlands for wildlife habitat. Existing projects are monitored on an ongoing basis to see if there are ways in which we can improve their biological productivity, and new projects are constantly being added to the ever-increasing list.

These new projects are of two main types, water control and marsh management. Water control projects include the creation of new wetlands where none existed before, the diversion of water into wetlands to ensure permanence, the construction or clearing of wetland outlets to enable water management and flood prevention, the modification of outlets to permit water level manipulations to increase the biological productivity of the wetlands, the construction of backflood irrigation projects to provide breeding pair space for birds and hay or pastureland for the farmer, and the provision of simple water control structures to ensure the lasting permanence of wetlands.

Where management of an existing wetland through water control is not possible, marsh management may be undertaken to increase its productivity. This involves activities such as the brushing of woody growth or fencing of upland areas to provide nest cover plots, the level ditching of wetlands which have become overgrown with emergent vegetation to provide open water areas and loafing sites, the construction of earthfill nesting islands and other nesting structures, and the provision of loafing sites for birds. These activities may also be carried out in conjunction with water control projects.

Ducks Unlimited's activities in Alberta are at present administered through a series of nine area offices coordinated by the Provincial Office in Edmonton. Offices are maintained at Brooks, Grande Prairie, Hanna, Lethbridge, Red Deer, St. Paul, Strathmore, Tofield and Westlock.

To date, approximately 500,000 acres of wetland habitat with 3,500 shoreline miles have been developed in Alberta. Some of Alberta's better-known natural history areas are Ducks Unlimited projects (Figure 1).

Many Calgarians who often go on birding field trips to the Irricana lakes are not aware that they may be visiting the (Texas) Irricana Lake, Texas-Fairburn, (Texas) Salt Lake or Bruce Lakes (Disney) projects. Other favourite spots in the Calgary region include Frank and Namaka Lakes, Stobart Lake, where Black-crowned Night Herons were first recorded in Alberta. Lethbridge naturalists may visit Stirling, King's or Yellow Lakes, Conrad Flats or the West Arm Pakowki projects where Alberta's first White-faced Glossy Ibis nested. Almost all of the Brooks area's most famous marshes, with the exception of Lake Newell, are projects - San Francisco, Bantry, Oakland and Fleischmann-Crab Lakes, Kininvie Flats, Louisiana Lakes, Tilley A and Tilley B and its extensions. (Tilley B also provides recreational fishing.)

The autumn visitor to the Hanna area may see geese flighting from Lake Coleman, Contra Costa Lake, Plover Lake or myriads of small dams storing water along the prairie coulees. Hundreds of central Alberta naturalists have at some time stood on the observation mounds to look for birds on the Beaverhill A project, once the South Bay of Beaverhill Lake. The litany of names rolls on through central Alberta - Driedmeat Lake, Ministik Lake, Saunders Lake, the Ribstone Creek marshes, Ben's Lake, Vermilion Lakes, Smoky Lake, Jessie Lake, Moose Lake, Whitefish Lake, Lac Ste. Anne, Lac la Nonne, Manawan Lake, Flat Lake, Amisk Lake, Calling Lake, Fawcett Lake, North Cache Lake, Rock Island (Orlaf) Lake, and Thunder Lake. In the Peace River area, there are Clairmont-Ferguson, Bear, Lac la Glace, George, Cadotte, Kakut, Winagami and Kimiwan Lakes. Far to the north are Hay and Habay.

Over 650 Alberta wetlands have been created or stabilized by Ducks Unlimited and their allies in wetland conservation including various federal and provincial government agencies, county and municipal governments, the Special Areas Board, the P.F.R.A., and the Eastern, Western, Bow River, St. Mary's River and other irrigation districts of southern Alberta. The work goes on in a race against time. Recently, the Government of Saskatchewan and Ducks Unlimited Canada launched the Heritage Marshes Program for Saskatchewan. This program to save five of Saskatchewan's best marshes is a cooperative venture which includes the Government of Saskatchewan, Ducks Unlimited, the Saskatchewan Natural History Society, Saskatchewan Wildlife Rederation, and the Nature Conservancy of Canada. To date, two of these wetlands have been named, Thunder Creek and Ponass Lake, which total over 15,000 acres.

A similar cooperative venture is presently under discussion with Alberta government officials.

1. West Arm Pakowki
2. King's
3. Conrad Flats
4. Stirling
5. Yellow
6. Bantry
7. Kininvie
8. Tilley A
9. Tilley B
10. Louisiana
11. San Francisco
12. Oakland
13. Fleischmann-Crab
14. Frank
15. Namaka-Stobart
16. Bruce (Disney)
17. Texas-Irricana
18. Texas-Salt L.
19. Texas-Fairburn
20. Coleman
21. Contra Costa
22. Plover
23. Ribstone
24. Dried Meat
25. Saunders
26. Ministik
27. Beaverhill A
28. Vermilion
29. Ben's
30. Jessie
31. Moose
32. Whitefish
33. Smoky
34. Manawan
35. Lac Ste Anne
36. Lac La Nonne
37. Thunder
38. North Cache
39. Amisk
40. Flat
41. Calling
42. Rock Island (Orlaf)
43. Fawcett
44. Utikuma
45. Winagami
46. Kimiwan
47. Cadotte
48. Kakut
49. Clairmont-Ferguson
50. Bear
51. Lac La Glace
52. George
53. Habay
54. Hay

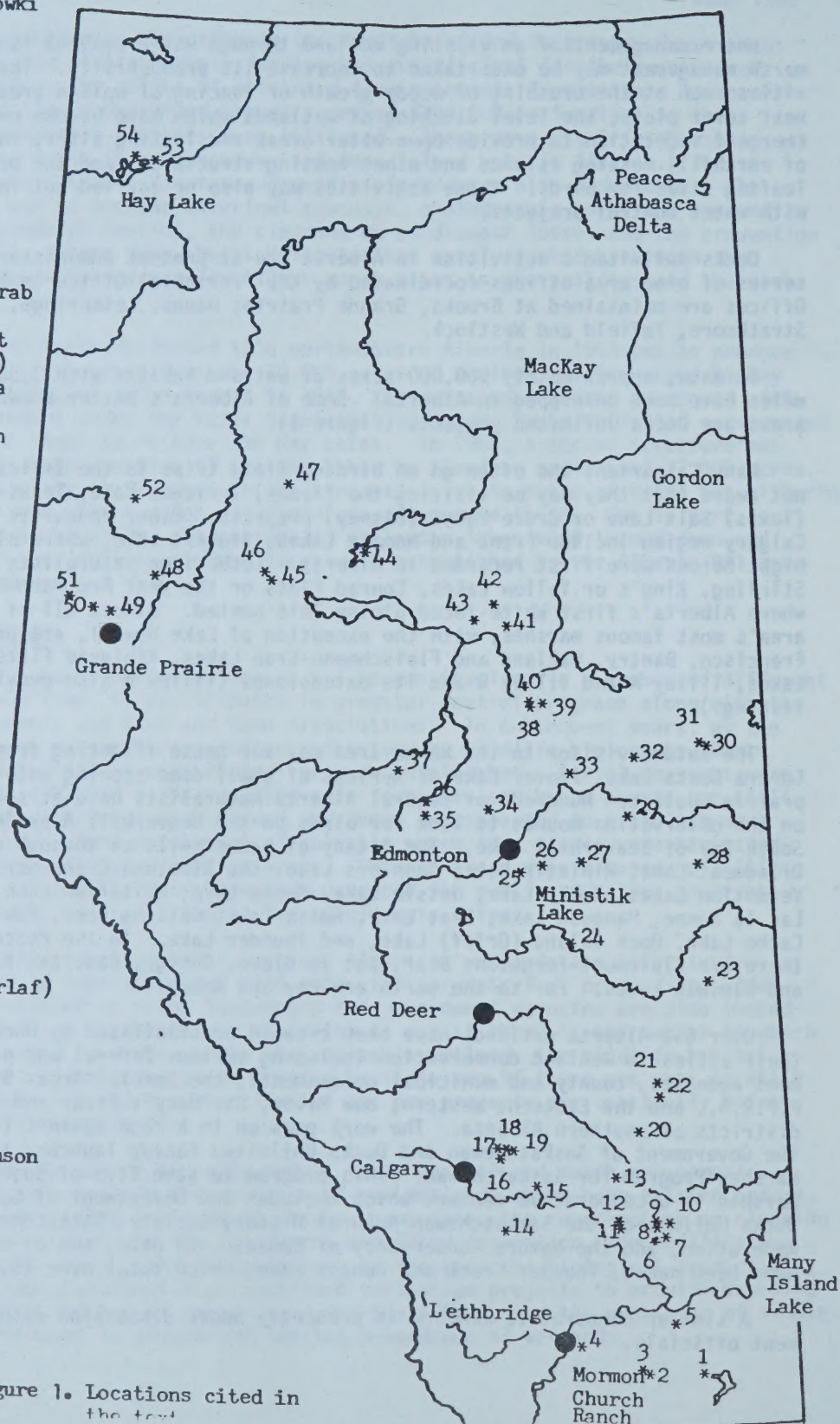


Figure 1. Locations cited in the text

Ducks Unlimited's activities in Canada acquired an added dimension in 1974 when a membership drive was launched and Canada's first ever Contributor Banquet was held in Tillsonburg, Ontario. Since then, a number of dinners and fund-raising events have been held throughout Canada. In 1980, Calgary established a new record for funds raised at such a first-time event anywhere when \$96,000 was raised. Edmonton and Lethbridge have also held fund-raising events that year and the program has since expanded to include several other Alberta centers. Across the country, Canadians are responding to the call to aid in wetland conservation.

It is estimated that 100,000,000 acres of North America's wetlands have been lost in the last 75 years, including 40 per cent of the wetlands in western Canada. It is imperative that we save what remains if our annual waterfowl spectacle is to continue.

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AMPHIBIAN AND REPTILE POPULATION SURVEYS

by W.E. Roberts, Curator
Museum of Zoology, University of Alberta
Edmonton, Alberta T6G 2E9

Naturalists everywhere can contribute greatly to the body of knowledge about the flora and fauna of the areas they frequent by recording their observations. The significance of individual observations may not be fully appreciated without the existence of other recorded observations for comparison. Many potentially useful natural history observations become of questionable value if some record of measurable information (date, time, number of individuals, etc.) is not made. It is difficult to rely on memory as a source of comparative information. If naturalists record their observations made at regular intervals at a number of chosen sites such records can, over a period of time, document changes occurring from season to season or from year to year and also provide a basis for site to site comparison. The Christmas Bird Counts are familiar examples of regular censuses in which numerous observers record much information regarding diversity and abundance of birds.

There are eighteen species of amphibians and reptiles known to naturally occur within Alberta. Table 1, a key to adult amphibians and reptiles of Alberta, provides a means of distinguishing species. In the case of the Western Painted Turtle and the Eastern Short-horned Lizard, a brief description is given in order to distinguish these from other turtles and lizards as the key merely indicates a turtle as opposed to a lizard and otherwise does not distinguish between these and other species. A more complete description for each species should be consulted following their identification utilizing this key. It may be found that certain characteristics utilized in the key differ with what is printed in field guides published elsewhere but keep in mind that species do vary over their ranges and the information utilized in this key is derived from specimens found within Alberta.

Although less obvious than most native fauna, owing to their small size, cryptic coloring and behavior and the fact that most are silent for all, or in some cases most of their active seasons, amphibians and reptiles may be observed regularly or seasonally owing to the regularity with which they are associated with specific habitat types and sites. All of the amphibian species found in Alberta spawn in bodies of water in spring or early summer. Frogs and toads vocalize at this time attracting conspecifics to spawning sites and females to individual males or groups of males depending on the species. Spring vocalizations by male anurans may be used by naturalists to locate spawning sites. The extent to which each site is utilized by the various species can be determined by counting the number of adults seen, the number of egg masses seen and shortly thereafter by the numbers of tadpoles seen. Reproductive success can be determined by enumerating the newly transformed frogs and toads along the margins of the spawning sites following metamorphosis in mid-summer. Immature frogs and toads are not accurately enumerated during visits to spawning sites early in the year as they may emerge later than mature individuals and do not immediately associate themselves with the margins of bodies of water although they do to some degree as the season progresses and terrestrial habitat becomes drier. Following spawning, terrestrial sample plots adjacent to the margins of the spawning sites can be used to provide information about the abundance and distribution of the various sizes and species of anurans adjacent to the body of water. A plot with a 10m border along the margin of the water and extending up-land for 100 m is easily surveyed by one or more persons in a short period of time.

TABLE 1. KEY TO ADULT AMPHIBIANS AND REPTILES, AND GENERA OF LARVAL AMPHIBIANS OF ALBERTA

- | | |
|---|--|
| 1a. Body covered with scales (2) | |
| 1b. Body lacking scales (9) | |
| 2a. Limbs present (3) | |
| 2b. Limbs absent (4) | |
| 3a. Body covered by a carapace (shell) | Painted Turtle <i>Chrysemys picta</i> . Front feet with five webbed toes with claws, plastron (ventral shield) made of six pairs of shields. Carapace low with smooth posterior border. |
| 3b. Body lacks shell but skin possesses spines and tubercles. | Short-horned Lizard <i>Phrynosoma douglassi</i> . Squat lizard with short pointed horns on back of head, sides of body with lateral fringe of pointed scales (lateral abdominal spines). |
| 4a. Rattle or button present on end of tail | Prairie Rattlesnake <i>Crotalus viridis viridis</i> . |
| 4b. Rattle or button absent (5) | |
| 5a. Body usually with one middorsal and two lateral stripes, scales in 19-21 rows (6) | |
| 5b. Body without stripes. Scales in 25 or more rows (8) | |
| 6a. Ground color olivaceous, no black markings on upper labials (scales forming margin of upper jaw), mid-dorsal stripe yellow (may be faint, broken or indistinct) | Western Garter Snake <i>Thamnophis elegans</i> |
| 6b. Ground color blackish, black markings present on upper labials, distinct middorsal stripe (7) | |
| 7a. Middorsal stripe orange, distinct black marks on upper labials, lateral stripes on 3rd and 4th rows of scales | Plains Garter Snake <i>Thamnophis radix</i> |
| 7b. Middorsal stripe yellow, black marks (if present) on upper labials indistinct, lateral stripes on 2nd and 3rd rows of scales. Orange or red blotches may be present above lateral | Red-sided Garter Snake <i>Thamnophis sirtalis parietalis</i>
Trinomials are used where we can recognize distinct western subspecies. This can be important. |
| 8a. Snout upturned and shovel-like | Western Hognose Snake <i>Heterodon nasicus</i> |
| 8b. Snout not modified to form shovel | Bull Snake <i>Pituophis melanoleucus sayi</i> |
| 9a. Median dorsal fin present on tail and posterior body (19) | |
| 9b. No median fin on tail or posterior part of body (10) | |

TABLE 1. (continued).

10a.	Hind limbs about as long as forelimbs and not modified for hopping (11)	
10b.	Hind limbs longer than forelimbs and modified for hopping (12)	
11a.	Yellowish middorsal stripe (may be broken) with irregular margins. Long slender digits.	<u>Long-toed Salamander <i>Ambystoma macrodactylum</i></u>
11b.	Mottled or barred dorsal surface, short, stubby digits with cornified tips.	<u>Tiger Salamander <i>Ambystoma tigrinum</i></u>
12a.	Dorsolateral folds (slightly raised glandular ridge along each side of back) present (13)	
12b.	Dorsolateral folds absent (15)	
13a.	Green with black spots (spots have light border)	<u>Northern Leopard Frog <i>Rana pipiens</i></u>
13b.	Brownish and lacking large spots (14)	
14a.	Red color on ventral surface, tubercles on back, eyes look upwards.	<u>Spotted Frog <i>Rana pretiosa</i></u>
14b.	No red color on ventral portions of body, back smooth, eyes look laterally, mask.	<u>Wood Frog <i>Rana sylvatica</i></u>
15a.	No metatarsal tubercles (dark hard spadelike structures on hind feet), small with granular surface on ventral skin	<u>Boreal Chorus Frog <i>Pseudacris triseriata maculata</i></u>
15b.	metatarsal tubercles present (16)	
16a.	Single metatarsal tubercle, skin smooth, pupil of eye vertical.	<u>Plains Spadefoot <i>Scaphiopus bombifrons</i></u>
16b.	Two metatarsal tubercles, skin rough and warty, pupil of eye horizontal (17)	
17a.	No crests or raised ridge between eyes	<u>Western Toad <i>Bufo boreas</i></u>
17b.	Cranial crests present (18)	
18a.	Cranial crests parallel.	<u>Canadian Toad <i>Bufo americanus hemiophrys</i></u>
18b.	Cranial crests diverge posteriorly	<u>Great Plains Toad <i>Bufo cognatus</i></u>
19a.	External gills present (20)	
19b.	External gills absent (21)	

You have larval *Ambystoma* - Good Luck!

- 20a. These are keyed out with difficulty.
20b.

TABLE 1. (continued).

21a.	Anus median (22)	
21b.	Anus opens on right side of tail fin (23)	
22a.	Lips infolded laterally (notched) with papillae present	<u>Bufo spp.</u>
22b.	Lips not infolded laterally and with papillae around entire lip (may be absent on midline of front lip).	<u>Scaphiopus</u>
23a.	Lips infolded laterally	<u>Rana spp.</u>
23b.	Lips not infolded laterally	<u>Pseudacris triseriata</u>

If such 10 x 100 m plots are surveyed a number of times per year, the sum of all frogs and toads counted will provide a more accurate estimate of the population as all individuals are not likely to be seen on a single visit. (It is recognized that some individuals may be seen and counted more than once but this should not give rise to a large error in estimates of abundance). Visits during different times of the year will also yield information on seasonal changes in distribution with respect to distance from water on the plot.

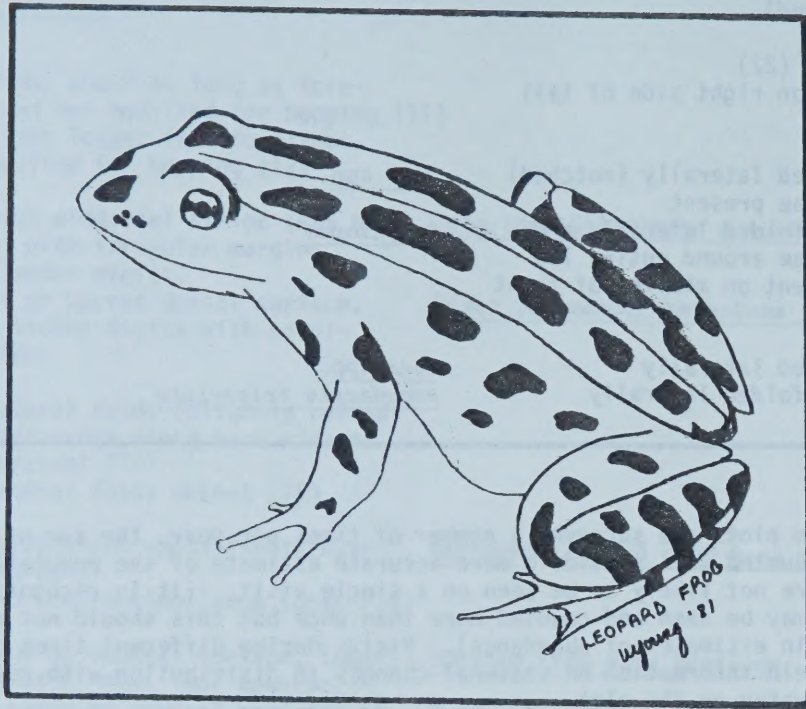
Over most of Alberta the Boreal Chorus Frog is the most abundant amphibian and the most frequently heard (it calls both well before and after its spawning period) yet in spite of this is seldom seen in direct proportion to its abundance. Owing to its very small size (less than 1-1/2", 3.8 cm), its habit of spreading its egg masses throughout spawning ponds rather than depositing them in groups, and its close association with cover it is a real challenge to see in any numbers. While highly subjective the extent of calling provides the best evidence of the abundance of this species but does not provide figures for comparison with other species or from site to site. The spadefoot and true toads in dry areas or in times of hot dry weather are often most active nocturnally and may be enumerated by counting individuals on transects along roads or trails at night.

Salamanders are not heard vocalizing during their spawning period and must be sought out under logs or other cover adjacent to spawning sites. In late summer the conspicuous large larvae may provide the best evidence of a local population of salamanders. Some adults remain in the water while others disperse and become fossorial, making enumeration difficult.

Turtles are best observed at basking sites such as partially submerged logs where they may be seen if approached with caution or, better still, observed at a distance through binoculars. Tell-tale scratch marks provide evidence that a particular log is used for basking by turtles. Information concerning turtle populations in Alberta is meager at best.

Short-horned lizards are slightly better known than turtles in Alberta but long-term observations to provide data concerning populations are lacking.

Five of the six native snake species in Alberta are known to hibernate com-



munally in traditional hibernacula. From one to several species (depending on the locality) may be found near the opening to a natural or man-made cavity where refuge from freezing temperatures may be obtained during the winter. During visits to these areas in both spring (April-May) and fall (September-October) it is possible to enumerate the populations of adult snakes at particular hibernacula. As snakes may disperse as far as about 10 miles (but usually much less) from these hibernacula, it can be appreciated that when they are dispersed during the summer, it is difficult to detect their presence, let alone their abundance.

While the number of amphibian and reptile species at a particular site in Alberta is small, the number of individuals under favorable conditions may be large. Most species are at or near the Northern limits of their ranges within Alberta and their adaptations to the severe cold and short active season are probably taxed to the maximum. Population fluctuations may be common under such conditions. Owing to their relative immobility (most amphibians in Alberta probably spend their entire life within a few hundred yards of their birth place) and their sensitivity to physical and chemical changes in the bodies of water in which they reproduce and their position in the food web as predators of invertebrates they are good indicator organisms with respect to environmental change. While only slightly more mobile, their dependency on small animal life for food and their utilization of traditional communal hibernacula make snakes good indicator species as well. Unless documentation of population trends for these organisms is undertaken natural fluctuations cannot be distinguished from catastrophic population declines. Naturalists can contribute a great deal to our knowledge of the status of amphibian and reptile populations. Such information can be collected on field trips normally devoted to observations of waterfowl or other flora and fauna of wetlands, and thus further

enrich ones understanding and appreciation of these ecosystems. It is only important that these observations be systematic; that is based on a regular series of visits to a number of chosen sites. The most useful data requires little equipment, your eyes and a notebook. A pocket thermometer can be useful as many important life history events of ectotherms are dependent on air or water temperatures. The recording of observations requires little time for individual observations. The sum of numerous small observations can contribute a great deal to our understanding of the world in which we live.

Any information forwarded to the University of Alberta Museum of Zoology will be gratefully incorporated into the species accounts records and will add to a growing body of knowledge about the amphibians and reptiles of Alberta. While information about the less common species is most desirable, it is important not to overlook the more common and widespread species as they are useful indicators of change. It is hoped that this article will encourage naturalists to view amphibians and reptiles they encounter with more than just a casual glance. With organisms such as these, about which there is a great deal to be learned, naturalists can make very meaningful contributions.

EDITORIAL: THE ANTLER TRADE IN ALBERTA

by Fred Schutz

R.R. #2, Bluffton, Alberta T0C 0M0

There is one phase of farming in Alberta which naturalists should condemn, and that is the raising of wild animals under a game farm license for the purpose of "harvesting" antlers. Elk or Wapiti seem to be the preferred species for this objectionable industry, since elk are fairly easily kept in confinement. Moose, which have almost as heavy an antler as elk, do not thrive when confined. Now northerners have gotten into the act, removing antlers in early summer from the semi-domesticated reindeer herds.

The market for elk and reindeer exists mainly in the Orient and parts of Siberia. It is a strong market, and international prices, according to a University of Alberta scientist, run about \$200 per kilogram. One mature elk will produce five kilograms each year. Since the antlers have to be taken in the velvet stage in early summer, this means dehorning while the antler is engorged with blood vessels, with resultant severe bleeding. And to what purpose? Not for any real benefit to humankind, not to help the animal, but just for the profit of a few.

The antler product, dried and ground, or dried and sliced, is used in the preparation of "folk medicine", to quote the newspapers. In plainer language, it is valued in various parts of the world as an aphrodisiac.

Objections to antler farming are three. Most importantly, the existence of a market for antlers provides a ripe climate for poachers. An elk with \$1,000 worth of antler on his head is a pretty tempting target. Secondly, it is a charlatan practice, not worthy of sanction by any government. Laws have been in existence in this country for many years to prevent snake oil road huckstering and other cure-alls. Why, then, grant permits to legally produce a so-called "aphrodisiac" on a large scale? In the third place, it constitutes unnecessary cruelty to the animals.

There are at least two licensed game farms producing dried elk antler in Alberta. One is near Edmonton, the other near Bowden and said to be owned by a Calgary businessman. Visitors are not welcomed there, and information on the operation is difficult to come by. What are they trying to hide?

[Do any readers have additional information on this issue? - Editor]

EDITOR'S PAGE

This is the first issue of the *Alberta Naturalist* to focus on a single issue, namely, Endangered and Threatened Species/Habitat. It has been estimated 25,000 plant species and more than a thousand species/subspecies of vertebrates are threatened with extinction. If one considers invertebrates, it is possible a half a million to a million species/subspecies will have become extinct by the end of this century. Assuming the smaller estimate, that amounts to more than 27,000 extinctions per year!

We are dependent upon animals and plants for food, clothing, shelter, medicines and innumerable other things. As the human population continues its upward spiral, so do our demands on our ever-shrinking resource base. The earth's capacity to support people is being irreversibly reduced, largely due to resource mismanagement. Aesthetic, moral, economic and political considerations aside, our very survival as a species may depend upon the adoption of world-wide policies to reverse the destruction of our life support system.

We do not have sufficient knowledge about what our future needs for survival may be, or what wild species may become important to our survival base. Therefore the genetic diversity of the earth's wild species must be preserved. As habitat is systematically destroyed, so is the potential for not only improving our existence, but insuring our survival.

We are at a critical juncture in history. The damage we've inflicted thus far on the planet is not yet beyond repair. However, the time is at hand to press for maintenance of a sustainable ecosystem, or future generations may well inherit nothing more than a barren wasteland.

On another note, you will notice lateness has continued to be a problem with the *Alberta Naturalist*. To correct this situation, I have revised deadline dates as follows: February 1; May 1; August 1; and November 1. Rather than wait for promised articles which are late, our major cause for delayed issues, typing of the final copy will begin on the above dates and material received after will be held for the next issue. Let's hope this works!



ENDANGERED/THREATENED WILDLIFE BRIEFS

by Fred Schutz
R.R. #2, Bluffton, Alberta TOC OMO
and Virginia Young
R.R. #1, Busby, Alberta TOG OHO

In 1981, the Northwest Territorial Government gave approval to the Inuit people to capture 50 Gyrfalcons from the wild to be sold to the Middle East for \$30,000 each. In response to an inquiry, John Roberts, Minister of the Environment, said: "I understand that the proposed capture of 50 Gyrfalcons in the Central Arctic, which was authorized by the Northwest Territories Wildlife Service, did not take place last October because of poor weather conditions. The management and protection of birds not named under the Migratory Birds Convention Act are the responsibility of the Provinces and Territories. Nevertheless, officials of the Canadian Wildlife Service of my Department are concerned about the status of the Gyrfalcons population in the Central Arctic. For that reason they have recently written to the Chief of the Northwest Territories Wildlife Service urging that population surveys be undertaken in the region before any capture permits are issued in the future. They have also offered to provide technical assistance for studies and surveys of any region of the Northwest Territories should requests for the exploitation of Gyrfalcons in those regions be considered. We anticipate a positive response." The taking of falcons from the wild is an issue to be watched closely in the future. . . The self-sufficiency, back-to-the-land, natural food craze is beginning to take its toll in and around urban areas. Edibles such as Marsh Marigolds and Fiddlehead Ferns have been decimated in some areas, to the dismay of non-consumptive users. . . One of our largest White Pelican nesting colonies continues to be threatened by a proposed dam on the Slave River. . . Native flora in Alberta and Saskatchewan has been preserved in some instances along railroad rights-of-way. With extensive abandonment of railroad lines, the rather accidental ecological reserves that have endured here for decades are in danger as other disposition is being made for these rights-of-ways. . . A program to re-introduce the Kit Fox to Alberta has been underway for some years now near Bottrel. According to recent reports, the program is quite successful. . . The future for Peregrine Falcons looks promising. Cornell University has successfully bred them in captivity since 1973 and now produces about 200 young per year. About 100 per year are produced at Canadian Wildlife Service's Wainwright facility. Many captive-bred young have been successfully returned to the wild and are now breeding in both Canada and the United States. . . The Wood Bison, or Wood Buffalo, is making good progress, and their restricted area south of the highway in Elk Island National Park may be opened to the public by 1985. . . The Whooping Cranes in Wood Buffalo National Park only hatched 3 chicks last year. All three were captured before migration and fitted with radio transmitters so their flight south could be monitored. One was tracked all the way to the Texas wintering ground. One was killed by striking a power line, and we are unsure of the fate of the third one. Allowing for natural attrition of the flock, Whooping Crane numbers may show a slight decline for 1981. . . Our northern Caribou herds are in danger, primarily from over-hunting. One herd, known as the Beverley herd, has dwindled from 210,000 in 1971 to 84,000 in 1982. Native hunters are so well-equipped today that hunting pressure has increased drastically. This brings up the question of aboriginal hunting rights, and perhaps the time is here for environmental groups to take a stand. . . The Peary Caribou is threatened by petroleum exploration at Polar Bear Pass on Bathurst Island. A herd of Muskoxen there may also be threatened. . . Whales, particularly the

Right Whale, are still in danger. Right Whales are found in Canadian waters, and yet Canada is now assuming a neutral stance in the movement to protect some of the world's rare and fascinating animals from slaughter by other nations, having withdrawn from the International Whaling Commission. . . Work on the Red Data Book, published by the International Union for the Conservation of Nature, on Invertebrates is well underway, due for release in late 1982 or early 1983. . . Going further afield, it appears the end is at hand for Florida's Dusky Seaside Sparrow. There are only five of these birds known to be left alive, all males in captivity at the Florida State Museum, as of Spring, 1981. (BirdScope). . . The population of the diminutive subspecies of Aleutian Canada Goose is quickly rebuilding. Supplemented by captive-bred birds, there are now 2,600 wintering in California, up from a low of 800 in 1975. . . The Ivory-billed Woodpecker was once again seen in Cuba in November 1980. A tour was arranged for April of this year to try to locate it, but no word yet on their success (BirdScope). . . The Hawaiian Crow population is variously estimated at between 30 and 150 birds and declining. The state is attempting a captive breeding program, so far unsuccessfully. The birds breed well enough but the eggs or young always disappear, so there are plans to move the program to the better facilities of the San Diego Zoo. (BirdScope). . . Two pairs of Crested Ibis (*Nipponia nippon*) have been discovered nesting in China. Both pairs were on nests, one of which held three young birds, the other none. The last official record of the Crested Ibis from China is a bird collected in the Qinling Range in June 1960. In the spring of 1978, a single bird was reported in Cho-chan Province. This compliments the six individuals in captivity in Japan (BirdScope). . . A new natural preserve was recently established in South China. Guangdong Province has designated 7,333 hectares as a natural preserve under special protection. The area is well known for Indochinese Tigers, Pangolins and Spotted Deer. . . The Bavarian forest, one of the richest in the Federal Republic of Germany, is being severely depleted. One thousand five hundred hectares have been lost in the last five years, despite Germany's forest protection legislation which recommends that every section of forest felled should be replaced by plantations of the same size. 80,000 hectares of fir forest are currently affected in Baden-Wurttemberg and Bavaria. The cause of the decline - acid rain. . . A successful reintroduction of the Asiatic Wild Ass (*Equus hemionus*) was completed in the Soviet Union last year. Between 1978 and 1980, 22 animals were transported from the Badkhysh Nature Reserve in the Turkmen Soviet Socialist Republic for reintroduction on two sites near the foothills of the Eastern and Central Koptedag Mountains. These are among the first experiments of this nature ever undertaken by Soviet scientists. Reintroduction of the Asiatic Wild Ass in the Turkmen and other Central Asian Republics is expected in increase in the future. . . Fearing extinction in the wild, in 1962 a small group of Arabian Oryx (*Oryx leucoryx*) were captured to form the nucleus of the World Herd based in the U.S. A few years later, the last wild Oryx was poached. Now, ten years later, ten Oryx have been released as part of an on-going program to help restore Oryx to its native habitat. . . The Kashmir Stag, *Cervus elaphus hangul*, is in grave danger. 30 years ago, at least 2,000 animals wintered in the Dachigam Sanctuary in Kashmir. Today only about 200 make their last stand there. . . Millions of songbirds are still shot each year for food, especially in Italy. . . In Africa the black spot on the map is Uganda, once termed the garden spot. 90 per cent of its elephants and 75 per cent of its hippos have been slaughtered in the past 3 years. In addition thousands of antelope and other animals have been killed.

The problem of endangered species and species' extinction is a vast one, and a serious one, but it is an issue that has so far not been perceived by governing bodies to be crucial to man's existence here, and therefore maintains a low profile. The above accounts reflect only the tip of the iceberg. It is up to naturalists throughout the world to act as watchdogs, and not only write letters to politicians, but support, physically and financially, those organizations which are working to preserve natural habitat and the environment.

FAN NEWS

SEPTEMBER FAN MEETING

The Red Deer River Naturalists will host the fall FAN meeting on September 18 and 19th, 1982. It will be held at the G.W. Dawe Community School and Centre, 5605 Holt Street, Red Deer. Turn east off Highway 2 on the Burnt Lake overpass. Turn right (south) at the second set of lights.

Field trips are scheduled for 10 am and 1 pm on Saturday, and on Sunday there will be an "early bird" trip and another from 10 am until 1 pm. On Saturday evening a cold plate evening meal will be served at Dawe Centre at 6 pm. Costs will be \$6.75 for adults, \$3.30 for children under 12. The organizers would appreciate advance notice if you plan to attend the supper, but a decision upon arrival would be satisfactory. Contact RDRN, Box 785, Red Deer AB T4N 5H2 (phone 347-4827). Following the supper, an evening program, tentatively scheduled "Bluebirds", will be presented. Coffee and goodies will conclude the evening.

Dawe Centre has an indoor pool and a hot tub. Billets will be available - check at the Registration Desk at the Evening Meal. There are two convenient campgrounds - Lion's Campgrounds (north of river just east of Gaetz Avenue) and Old Timer's Campground (1 km west of Hwy. 2 at Riverview Entrance).

We look forward to seeing you there.

FAN RESOLUTION REGARDING LAND USE IN THE BOW VALLEY

Whereas the Bow Valley Naturalists, one of our corporate member clubs, have requested an Environmental Assessment and Review for the town of Banff and its vicinity;

And whereas we share their concern that a land use crisis is developing in the Bow Valley;

And whereas we believe that the tentacles of transportation routes and urbanization are growing and becoming more substantial in this part of Banff National Park;

And whereas the freedom of movement for wildlife is becoming curtailed;

And whereas the delineation of boundaries for the town of Banff must be determined on ecological grounds;

Be it resolved that: The Federation of Alberta Naturalists support the request of the Bow Valley Naturalists for an Environmental Assessment and Review for the town of Banff and its vicinity as the best process available to determine both the boundaries of the town and the proper or best uses of the surrounding lands.

[Sent to The Honourable John Roberts, Minister of the Environment, House of Commons, Ottawa, Ontario K1A 0H4.]

FAN COMPETITION OF ENVIRONMENTAL THEMES

The Fifth Annual Competition of Environmental Themes sponsored by FAN can be termed a success.

The winners in Category I for Grades 1, 2 and 3 Alberta Animal or Bird Song, in which contestants were asked to tape your own song about an Alberta animal or bird to the tune of a well-known song. It was judged by the Environmental Awareness Group who volunteer their help for environmental trips in the Lethbridge School District. The winners are:

- 1st prize, \$50.00 "It's a Great Horned Owl" (Tune "It's a small world. . ."),
Grade 2 Dorothy Oakley School, Vermilion.
2nd prize, \$35.00 "The Story of a Varying Hare" (Tune "This land is your land. . .")
Grade 2 Grandview Elementary School, Red Deer.
3rd prize, \$25.00 "The Moose Song" (Tune "Baa, baa, black sheep")
Grades 1 and 2, Paddle Prairie School.

Details of Category II - Environmental Concept Board or Word Game using ideas demonstrating some natural science concept such as animal adaptation, food chains and plant succession.

- 1st prize, Erin Edwards and Barbie Tunn, Grovenor Elementary School, Edmonton
2nd prize, Grade 5, General Stewart School, Lethbridge (Catherine Khan, teacher)
3rd prize, Grade 5, General Stewart School, Lethbridge (Catherine Khan, teacher)
Honorable Mention: Fawcett Elementary (Marlene L. Crammond, teacher)

The prize-winning songs will be published as part of future "Junior Naturalist" sections.

- Mary Bailey

CLUB NEWS

CALGARY FIELD NATURALISTS' SOCIETY

Our membership has now climbed to 300 and we are thinking of finding a larger meeting room for next year. We have enjoyed talks on permafrost (Dr. S.A. Harris), snow geese (Judy Smith), the Mackenzie Mountains (Sam Miller) and the horned lizard (Larry Powell). The AORC will give us a presentation on 'bird-mapping' in May and so to our AGM in June and the end of a good season for CFNS.

The Audubon film series has shown a small profit for this year, and we have booked a programme of 5 films for 1982-83.

We have been able to continue Pica, our quarterly magazine, and thank editor Ann Machin for her work in compiling the magazine and keeping costs down.

The Bird Study Group has a Birding Guide to Calgary nearly ready to print and the Botany Group is starting its monthly field trips now that the snow has at last gone.

As July approaches, work for the Canadian Nature Federation conference gathers momentum and we look forward to seeing many of you there - and to a holiday when it is all over!

- Dorothy Dickson

LETHBRIDGE NATURALIST SOCIETY

The summer field trip program includes outings to the Porcupine Hills, McIntyre Ranch, Drywood Falls in the Pincher Creek area, an overnighter to the confluence of the Bow and Oldman Rivers, and Pakowki Lake.

Some of the active birdwatchers in the club have formed a Bird Study Group. They are planning a number of long-term projects and field activities for the summer. They have two major objectives: (1) to develop individual skills at bird observation and to encourage new interest in bird study; and (2) to organize birding efforts in the Lethbridge region. The largest project will begin this spring in the form of breeding bird surveys in the Stirling Lake and Lethbridge areas, in conjunction with the Alberta Bird Atlas Project. The data collected will be compiled at Edmonton along with similar breeding surveys carried out by other centres in Alberta. After the 5-year atlas project period, in 1986, all Alberta data will be published as

a baseline atlas with maps for each bird species. It can be used as a basis against which future changes in bird populations may be measured.

RED DEER RIVER NATURALISTS

The Red Deer River Naturalists are now publishing a quarterly newspaper, the Central Alberta Naturalist. The purpose of this newspaper is to teach people about natural history and inform them of environmental issues. To subscribe, write Central Alberta Naturalist, Box 785, Red Deer T4N 5H2. Cost is \$7.00 single membership, \$10.00 family membership.

The RDRN have had mugs printed with their logo. They will be used for coffee after meetings, and can be purchased for \$2.50 each.

CANADIAN NATURE FEDERATION NEWS

ACTION REQUEST FROM CNF

In September, 1980, an exotic wildlife species, the European raccoon dog (*Nyctereutes procyonoides*) was imported into Ontario from Finland to establish a fur farm breeding operation. The raccoon dog is quite prolific - the original 140 animals increased to over 500 in 1981. The European experience shows that its high reproductive capability and adaptability poses an environmental hazard. It has spread from Russia into Scandinavian countries, France and Poland. A Guelph University report documents severe impacts on indigenous wildlife, especially waterfowl and ground nesting birds. The animal is a predator of crops and domestic fowl and is a carrier of parasites and rabies. The possibility that raccoon dogs could become established in the Canadian wild and supplant native wildlife led the CNF to press government for an end to the fur farming operation in Ontario and the removal of the animals from Canada.

The Federal Government responded in several ways. An Order-in-Council added raccoon dogs to the Import Control List of the Export and Import Permits Act. This action bans any further import of raccoon dogs into Canada. Further, the Foreign Investment Review Agency found that the Finnish investment was not in the best interests of Canada because of potential ecological problems, but a change to Canadian ownership has allowed the fur farm to continue. Federal negotiations with the operation's owner to ship the breeding stock back to Finland were not successful.

To my knowledge, the government of Ontario did little to prevent the import of raccoon dogs and has not sought to end the fur farm operation at Madoc. Most provincial and territorial governments have prohibited the import of raccoon dogs into their jurisdictions from Ontario. However, the prospect remains that further operations may be established in Ontario and that animals could spread throughout Canada by escape.

The events surrounding the raccoon dog problem raises a larger, very important issue - the need for Federal legislation which would ban the import or export of wildlife into or out of Canada or into or out of any province or territory, except under permit. The passage of such legislation requires consensus of the provinces and territories.

The impetus for legislation (a Wildlife Export and Import Act) was first given by the Federal-Provincial Wildlife Conference in 1968. Governments were urged to prohibit the import of non-indigenous species of wildlife into any province or territory of Canada, except under certain circumstances. We understand that, as a result of the

raccoon dog controversy, legislation was proposed to the provinces by the Federal government.

We need your help to stop the import into Canada of potentially damaging exotic wildlife. Please write: (1) Honourable William Davis, Premier of Ontario, Legislative Buildings, Toronto, Ontario M7A 1A1. Ask him to amend the provincial Fur Farm Act to prevent the transport and/or sale of raccoon dog breeding stock within Ontario. Tell him that you want to minimize or eliminate spread of raccoon dogs in Canada. Urge him to initiate and/or cooperate with other governments to purchase the current farming operation and to dispose of breeding stock. (2) Your provincial premier. Confirm that your province/territory has legislation to prevent the import of raccoon dogs from Ontario. Ask the premier to approve Federal legislation which would ban the import of exotic wildlife into Canada and regulate the transfer of wildlife within Canada. (3) Honourable John Roberts, Minister of the Environment, Ottawa, Ontario K1A 0H3. Urge him to initiate and/or cooperate with other governments to purchase the current farming operation and to dispose of breeding stock. Ask him to press provincial and territorial governments for agreement of proposed export and import legislation. If you want to comment on the legislation, ask for a copy.

We would appreciate receiving copies of your correspondence for our files.

- Richard Pratt, Conservation Director

CNF PURPOSES AND PRINCIPLES

The CNF Executive has recently approved a paper entitled "CNF Purposes and Principles". The paper, which was prepared by the Policy Committee, is a summary of purposes and beliefs in the wide spectrum of environmental questions with which we are faced. It makes for very interesting and informative reading. If you are interested in receiving a copy, write to Peggy Heppes, Managing Director, CNF, 75 Albert Street, #203, Ottawa K1P 6G1. It is hoped this paper will prove useful to affiliates in preparing their positions on various issues.

CONSERVATION NEWS

P.A.R.C. ACID RAIN RECOMMENDATIONS

The Prairie Acid Rain Coalition (PARC) has made the following recommendations: That the Government of Canada continue to make acid rain the number one priority environmental issue; that the recommendations of the House of Commons Sub-Committee on Acid Rain be implemented; that the Government of Canada continue to work toward an agreement with the United States for the purpose of controlling acid rain; that Canada not wait for the agreement to be completed, but that it use every means possible to control the sources of acid rain within Canada immediately; that the Department of Environment's public awareness campaign be continued in both Canada and the United States and that more emphasis be placed on increasing public awareness in Western Canada and in the United States; and that support be given to groups and organizations that are working to control acid rain. For more information contact Martha Kostuch, PARC, Box 1288, Rocky Mountain House, Alberta T0M 1T0.

ENVIRONMENTAL LAW ASSOCIATION OF ALBERTA

The Environmental Law Association was officially opened this spring and will operate under the following objectives: research in the area of environmental and

natural resources law, policy and procedure; education of the public in the above subject areas; monitoring of relevant municipal, provincial and federal law, policy and procedure and making recommendations for reform; and provision to the public of legal information, advice, referral and representation in environmental and natural resource-related matters. The Association welcomes requests for assistance from the public in environmental law matters, but will give preference to those issues which have a broad public impact. As far as resources permit, they will provide legal representation, referrals or research and skill development training and advice. Advocacy training will be a major focus. For more information call Linda Duncan, Environmental Law Association of Alberta, 411 Revillon Building, 10201-104 St., Edmonton AB T5J 1B2 (425-6740).

CANADA-UNITED STATES ENVIRONMENTAL COUNCIL RESOLUTIONS

The Canada-United States Environmental Council met in Washington, D.C., this spring. This Council is composed of representatives from some 26 Canadian conservation groups (including CNF) and 22 U.S. groups. Resolutions passed included:

- congressional extension and strengthening of the United States' Clean Air Act.
- Canada and U.S. should immediately institute requirements for the washing of all coal being burned in existing facilities and use newest anti-pollution devices before resorting to older equipment. Government agencies were called on to grant unrestricted public access to all emission data.
- establishment of a major park or wildlife preserve in northern Yukon Territory to compliment the U.S.'s Arctic National Wildlife Refuge. The proposed preserve would help sustain the 120,000 Porcupine caribou herd, shared by the two nations.
- the creation of a marine sanctuary in the Beaufort Sea and launching of a major study of Beaufort whales and other marine life before permitting further off-shore drilling in this arctic area.
- U.S. and Canada government support of an adequate global Law of the Sea treaty to regulate deep and seabed mining.
- halting of Garrison Diversion Project in North Dakota until it is modified to protect Canadian rights under the Boundary Waters Treaty.

NOTES & NEWS

INTERNATIONAL COUNCIL FOR BIRD PRESERVATION

The ICBP is conducting a membership drive currently. This group, with its many worthwhile programs, offer members the ICBP Newsletter and Annual Report. Membership costs \$35 (U.S.) per year, Supporting Memberships (which entitle one to one free copy of one new ICBP Technical Publication per year plus observer status at international meetings) for \$100, and Benefactor memberships (which includes invitations to international meetings and free copies of every ICBP publication. Write 219c Huntingdon Road, Cambridge CB3 0D1 England.

COLOUR-MARKED BALD EAGLES

Bald Eagles in Wyoming are being colour-marked with wing markers. Markers are blue on the left wing and green on the right. The letter E followed by 2 numbers is written on each marker. Some marked birds are expected in Alberta and Saskatchewan. For all sightings, please record date, time, exact location, color and position of markers and letters and numbers on markers. Report sighting as quickly as possible

by calling collect to M. Alan Jenkins, Federal Center, Bldg. 16, Denver, CO 80225, (303) 234-2126.

FYFE HEADS RAPTOR GROUP

Alberta Naturalist readers will be interested to learn that the Chairman of the International Council for Bird Preservation World Working Group on Birds of Prey is Richard Fyfe of the Canadian Wildlife Service in Edmonton. Richard is well-known for his longterm work on Canadian raptors, especially his banding projects and his captive breeding program for Peregrines.

- Martin K. McNicholl, based on note in Eyas 5(2).

TYRANNOSAURUS REX FROM HUXLEY

Fossilized remains of a Tyrannosaurus rex excavated from near Huxley, Alberta, about 90 km south of Red Deer have been brought to Edmonton to be separated from rock and transported to the new paleontological museum in Drumheller. Discovered in the 1940's, this find, only the fourth in the world, could only be excavated with modern equipment recently. The bones were embedded in 80 tons of ironstone.

- D.M.E. (from Edmonton Journal, Aug. 24, 1982)

ALBERTA BANDERS AGAIN REACH HIGH TOTALS

In his commentary on the 1980 banding report of the Western Bird Banding Association (Nor. Amer. Bird Bander 6: 84-85, 1981), Daniel M. Taylor lists Edgar T. Jones' 86 species as the second highest species total in the region, just short of the highest. James (Cam) Finlay is listed third among individual banders with high individual bird totals. Cam banded 3526 birds in 1980. The following species are listed in the annual report by Fern R. Tainter (NABB 6: 72-84, 1981) with highest totals by Alberta banders: Double-crested Cormorant - 583 (Provincial Museum Alta.); Broad-winged Hawk - 3 (Jones); Swainson's Hawk - 123 (Richard Fyfe); Ferruginous Hawk - 160 (Fyfe); Marsh Hawk - 5 (Fyfe); Gyrfalcon - 42 (Fyfe, tied with another bander, presumably not in Alta!); Spotted Sandpiper - 1 (Jones tied with another bander); Franklin's Gull - 18 (Finlay); Hawk Owl - 11 (R.E. Gehlert); Great Gray Owl - 6 (Gehlert); Saw-whet Owl - 6 (Jones); Downy Woodpecker - 6 (Finlay); Eastern Kingbird - 4 (Jones); Eastern Phoebe - 1 (Jones); Yellow-bellied Flycatcher - 1 (Jones); Alder Flycatcher - 29 (Jones); Least Flycatcher - 93 (Jones); Tree Swallow - 898 (Finlay); Purple Martin - 542 (Finlay); Blue Jay - 12 (Finlay); Common Crow - 5 (Jones); Black-capped Chickadee - 83 (Jones); Boreal Chickadee - 8 (Finlay); Red-breasted Nuthatch - 18 (Jones); Gray-cheeked Thrush - 2 (Jones); Mountain Bluebird - 1208 (Finlay); Red-eyed Vireo - 85 (Jones); Philadelphia Vireo - 10 (Jones); Black-and-White Warbler - 35 (Jones); Tennessee Warbler - 670 (Jones); Yellow Warbler - 113 (Jones); Magnolia Warbler - 44 (Jones); Cape May Warbler - 8 (Jones); Yellow-rumped Warbler (Myrtle race) - 277 (Jones); Black-throated Green Warbler - 8 (Jones); Ovenbird - 125 (Jones); Northern Waterthrush - 29 (Jones); Connecticut Warbler - 6 (Jones); Mourning Warbler - 14 (Jones); Canada Warbler - 6 (Jones); American Redstart - 239 (Jones); Northern Oriole (Baltimore race) - 10 (Jones); Rose-breasted Grosbeak - 23 (Jones); Evening Grosbeak - 292 (Finlay); Sharp-tailed Sparrow - 1 (Jones - tied with one other bander); Dark-eyed (Slate-coloured race) Junco - 102 (Jones); Clay-colored Sparrow - 6 (Finlay and Jones tied); and White-throated Sparrow - 47 (Jones).

- Martin K. McNicholl

BITS 'N PIECES

Our former editor, Martin K. McNicholl, was recently elected President of the Western Bird Banding Association. . . Following unanimous approval of the resolution to support the annual East Coast seal hunt, FAN's Patron, Hon. Dr. J.W. Grant MacEwan wrote an eloquent protest in the Calgary Herald. He said, among other things, "It is beyond my understanding that there is not one elected member who would raise his voice against the spectacle of mass slaughter by unbelievably primitive methods . . . That there is widespread feeling of revulsion to the seal hunt in Canada, as in the United Kingdom, the United States and European countries, can scarcely be doubted - but words and actions in the House of Commons give no hint of it. . ." . . . U.S. conservationists can sigh from relief as President Reagan has extended the "Endangered Species Act" without proposed loosening until 1983. . . George Calef was presented with the Francis H. Kortright Outdoor Writing Award for his book, "Caribou and the Barren Lands". [A review of this book is anticipated for the September issue of the AN - ed.]. . . According to a report in BirdScope, honey-based solutions are not to be used in hummingbird feeders. It is very easily contaminated and will become toxic. A 4 to 1 water to sugar solution is recommended. Anything stronger will make the birds ill. This solution can also sour, especially in hot, humid weather, so frequent refilling and a thorough cleaning of the feeders at each refill is urged. . . Ian McDougall, Chairman of the Canadian Wildlife Federation's Acid Rain Committee, was presented with the Governor General's Conservation Award in the field of Research, Education, Training and Legislation. . . The World Wildlife Fund has developed a dandy Wildlife Education Kit about Canadian Wildlife for Grades 4-6. Lots of hands-on goodies, participation-oriented, only \$30. Write Wildlife Education Kit, WWF (Canada), 60 St. Clair Avenue East, #201, Toronto, Ont. M4T 1N5. . . The Edmonton Bird Club and the Edmonton Natural History Society, combined with the City of Edmonton, the Edmonton Journal, the University of Alberta and other organizations held an 80th Birthday Reception on March 7 for FAN's newest Honorary Member, Robert Lister. Some 2,000 people attended and, of the occasion, Mr. Lister said "I felt much relieved when it was over but in retrospect it was a memorable occasion". (Mary Lore). . . The Honourable Bud Miller, Minister responsible for the Fish & Wildlife Division, recently announced a new award was being set up. This award, known as the Order of the Big Horn, will recognize citizens and organizations who have made a significant contribution to conservation of fish and wildlife in the Province. There will be several categories to the award and nominations will be requested from the general public (Westlock News). . . Edmonton's John Janzen Nature Centre's summer schedules include not only many interesting children's programs, but adult programs as well on bird identification, backpacking and mushroom identification and a course (with Joy Finlay) on sharpening your skills in helping children become more aware of the world around them and reinforce their natural curiosity. For details write "John Janzen Nature Centre, Edmonton Parks and Recreation, 10th Flr., CN Tower, Edmonton, AB T5J 0K1 (434-7446). . . The Provincial Museum has published a "Check-list of Spring-Flowering Plants in Alberta". It is available, free of charge, from Botany Programme, Natural History Section, Provincial Museum of Alberta, Edmonton, AB T5N 0M6. . . Interpretation Canada's Annual National Conference will be held 25-29 September at Banff. The theme is "New Frontiers", exploring new techniques, new audiences and new challenges for heritage interpretation. Write "New Frontiers", Box 2411, Banff, AB T0L 0C0 (762-3324, ext. 212 and 204). . . An interesting approach to nature interpretation is reported in the Manitoba Naturalists' Society Bulletin. Two naturalists formulated the idea of bringing bits of nature to shut-ins and elderly hospital patients. They have what they call a "magic box" containing such things as nuts, dried grasses, shells and rosehip jam. Using objects from the box as conversation openers, the naturalist shares with his audience bits of nature lore and experience. Each object triggers a memory or anecdote - this is where the "magic" comes in - resulting in friendly and animated conversations.

JUNIOR NATURALISTS' SECTION

THE PAINTED TURTLE

by Robert Varey
Grade 5A, Canmore School

I am doing my report on the Painted Turtle. This species is considered rare and endangered in Alberta.

The Painted Turtle is about six inches long. On the bottom of its shell you will find colors. This is why they call it the Painted Turtle. These colors are red, green and yellow. The bottom part of the shell is flat and smooth. The top part is rounded. There is a wide opening between the top and bottom of the shell and another at the back end. The turtle has a short, fleshy tail, and four chunky legs, and its head sticks out through the opening. The head is covered by a layer of scales, except for his beaklike mouth and his eyes. When danger threatens the turtle pulls in his tail, legs and head into his shell. The turtle's shell is made up of two different parts, the top and bottom. These parts are joined by bony ridges at the side. The upper part of the shell is called the "carapace", from the Spanish word meaning shield. The lower part is called the "plastron", from the Italian word meaning breastplate. The plastron and carapace are made up of many small, flat, bony shields or plates. These plates are fused with the turtle's backbone, ribs and parts of its shoulder and hips. The bony plates are covered with broad, thin scales called "laminae". The laminae are made of horny material something like your fingernails.

The Painted Turtle, when wild, eats minnows, but when tame eats insects. The Painted Turtle is usually found in lakes, ponds, swamps, streams and even roadside ditches. The Painted Turtle comes up on land to sun themselves or to lay eggs.

The reason I did this report on this species is because I have one.

PEREGRINE FALCON

by Marnie Vegesi
Grade 7, Banff, Alta.

The common name of this bird is the Peregrine Falcon or Duck Hawk. The species is Falco, the genus is peregrinus. The Peregrine Falcon has a wingspan of over 3' and is 15 to 21" long. The falcon has a wing color of dark blue-black with a dark brown face and crown. The peregrine is identified easily by a black moustache patch. Since it is a bird of prey it's equipped with sharp talons and a hooked beak for tearing their kill apart.

The Peregrine Falcon ranges from Alaska to Greenland, south to Baja California, southwest Texas, Colorado, northern Louisiana and northern Georgia. It winters in Argentina, not because it must escape the grasp of winter but to ensure good hunting. These falcons are found nearly worldwide.

The peregrine falcon rarely preys upon resting birds, but is more sporting. It preys on birds in flight. As soon as the falcon sees a bird that he wants he dives down towards his unsuspecting prey at speeds between 175 and 200 miles per hour. It knocks its prey senseless with a blow of its talons. It watches the dead bird fall to the ground, then plucks it clean and devours it. There are not enough falcons in one area to endanger any one species of birds.

The male peregrine falcon attracts female presence by doing awesome acrobatics and a rusty hinge wickew call. Four or five mottled mahogany eggs are laid. The males feed the females by air dropped bills which she fields in mid-air. The female protects the nest and is the largest of the two sexes.

Protection of the peregrine falcon is vital to its existence. You can play an important role in its survival, here's how to help: (1) prevent illegal hunting of this bird; (2) protect nesting ground from harassment; (3) use chlorinated hydrocarbon pesticides carefully and only when necessary; and (4) teach others to respect all birds of prey.

IT'S A GREAT HORNED OWL

by Grade 2, Dorothy Oakley School
Vermilion, Alberta

[This is the first prize winner of this year's Environmental Themes competition sponsored by F.A.N.]

TUNE: "It's a small world. . ."

There is just one owl and a golden moon,
It flies at night and it hunts for food.
The trees are blowing and the snow is glowing
From the light of the golden moon.

Chorus.

It's a great horned owl,
It's a great horned owl,
It hunts by night and sleeps by day,
It's a great horned owl.

It flies quietly and swoops down low,
It catches a mouse with its sharp claws low.
It takes its mouse to its warm, warm house,
And that's the great horned owl.

Chorus.



ENDANGERED SPECIES LIST GROWS

At the recent Federal-Provincial Wildlife Conference, held in Whitehorse, Yukon, J. A. Keith announced the addition of four species to the list of animals and plants that are considered Endangered, Threatened or Rare by C.O.S.E.W.I.C. (Committee on the Status of Endangered Wildlife in Canada). These four include:

small whorled pogonia - a flowering plant that is now Endangered,

humpback whale - now Threatened, like most of the large whales it is now depleted in both the Atlantic and Pacific populations due to commercial whaling,

prairie long-tailed weasel - now Threatened, human activity has severely reduced its habitat and numbers,

wolverine - now Rare, formerly lived in most of northern Canada, but now is reduced in numbers and total range -- its bad reputation among trappers could have contributed to its decline.

This brings to 52 the number of species on C.O.S.E.W.I.C.'s list.

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H. WALSH

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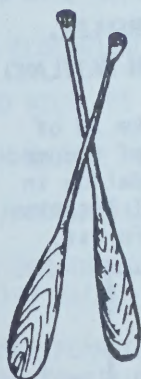
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Aldo Leopold spent a lifetime developing perceptions. . . a perception that heard music from the wild goose, then he said "In dire necessity somebody might write another 'Iliad' or paint 'Angelus', but fashion a goose?. . . If, then, we can live without goose music, we may as well do without stars or sunsets. . .".



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DEADLINES for submission of material for regular issues are: February 1; May 1; August 1; and November 1. All maps and charts should be submitted on 8-1/2" x 11" (or 8-1/2" x 7") white bond. Please indicate in light pencil any data which are to be typed on charts, maps, etc. Black and white photographs or slides, as well as line drawings, are most welcomed. Please include your complete mailing address.

DEADLINES for FAN project reports are: Alberta Flowering Dates, October 31, Dr. Charles D. Bird, Box 165, Mirror, AB T0B 3C0; Alberta Christmas Bird Counts, January 15, Virginia Young, R.R. #1, Busby, AB T0G 0H0; Species Count Day (May), July 15, Plants, J. Derek Johnson, Northern Forest Research Centre, 5320-122 St., Edmonton, AB T6H 3S5, Birds and Mammals, Al Wiseley, 202-635-56 Ave. SW, Calgary AB T2V 0G9. Compiler cooperation is appreciated.

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